TERWORLD COMPU

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IBM's ability to link two mainframes running VM seen as stopgap mea support CMS users who need a more functional ver-sion of VM/XA. Page 8.

Pairchild Semiconductor and Fuitlsu are still tied to gether despite bowing to buy-out opposition. Page

Portable 80386 machine arrives by mail. Page 35.

IBM end run will skirt PC-DOS limits

BY DOUGLAS BARNEY

IBM is slated next week to an-nounce support for Microsoft Corp.'s protected-mode DOS Corp.'s protected-mode IROS and to ease the expected one-year wait for that product with a version of its multitasking 3270 Personal Computer control pro-gram that will work with a broader range of PCs.

The new operating system SAA lays out

distributed

framework

IBM maps interfaces

for main product lines

BY ELISABETH HORWITT

nded ultimately to pull to-ser its divergent hardware,

products into a coherent distribed processing system.

tems Application Architecture, IBM finalized its commitment to

provide, during the next few

years, a set of common interfaces for communications, user access and applications software that is intended to run across

IBM Personal Computer, Sys-tem/36 and 38, and 370 archi-

The long-term goal of SAA is

"to provide key programming building blocks that will provide high-level interfaces into IBM's

high-level interfaces into IBM's communications" products, according to IBM manager of software marketing John Friedline. "Right now, [interfacing with various IBM communications ar-

chitectures) requires low-level Continued on page 129

will "let you do with a PC what a 3270 PC can do," a source close to IBM said. Those capabilities include windowing, multitasking and addressing more than 640K bytes of memory by splitting available memory into multiple

The current 3270 PC control program can address only one block at a time but can switch quickly between blocks, allowing terim solution and a viable long-term solution." the source said. Neither IBM nor Microsoft is ready to ship versions of a pro-tected-mode PC-DOS or MS-DOS, respectively. That operat-

ing system will exploit the true lities of the Intel Corp. capabilities of the Inter Corp. 80286 microprocessor. Howev-er, IBM will unveil its version of that unfinished operating system

The operating system is not expected to ship until the first quarter of 1988. The announceent will be the first formal un-

veiling of the Microsoft operating system, which that company is calling "New DOS." IBM's announcement of protected-mode DOS as much as a year in advance of delivery is aimed at educating large end us-

Bigger 3B2 to support LU6.2, Disoss

BY DATDICIA VESSE

NEW YORK - In its first major computer announcement in al-most a year, AT&T is set to unveil tomorrow the high end of its 32-bit inscriptocessor-cased 3B2 family along with support for IBM's LU6.2 and Distributed Office Support System proto-cols, according to sources close

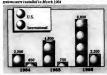
IBM last week laid out details of a major new framework that is AT&T's 3B line of supermi cros and minicomputers is wide-ly held to have been less than a resounding success since the first 3B2 was introduced in 1984. AT&T is hoping the 3B2/600, which insiders claim With the announcement of a statement of direction for Sysoutperforms any competitor in

its class, will change that percep-"That's an 80% increase is CPU power, a 100% increase in disk storage and a 400% increase in internal random-access memory over the 3B2/400." an AT&T salesman said. "It's going to be easy to go after Digital

ent Corp.'s Microvax," The 3B2/600 teatures AT&T's WE32100 chip, upgra-dable to the WE32200; AT&T's Unix System V Version 3.1.1: si-

users, with 90 physical ports; 4M to 16M bytes of RAM; 2.7 million instructions per second 18 MHz; a small com-Continued on barr 8

One step at a time Sales of AT&T's 3B2 line have doubled systems were installed in March 1984 ed annually since the first



CA CHURC MULCHETT I LEVEL

Citing Networker problems, Lotus misses Q1 ship target

BY PATRICIA KEEFE

CAMBRIDGE, Mass. - Probms with The Networker, Lotus Development Corp.'s network mplementation for 1-2-3 and Symphony, will force the firm to miss a first-quarter ship date. Lotus confirmed last week. The software publisher will The Networker will ship later date," Lotus sp O'Donnell said. However, some sources said they have been told The

Networker will ship in April. Last week, Greg Lazar, Lotus's director of field support, told the Chicago Association for Micro-computer Professionals that Lotus will announce its networking plans at the end of April. Many Lotus watchers said they expect s to talk about supp

DOS" and com Intel Corp.'s 80386 Lotus spokesman Greg Jar boe denied reports that the project is significantly behind sched ule, although one analyst claimed

that the product manager had told him last November to expect The Networker in January. Lotus first revealed plans for The Networker last August. The Networker will reportedly en-able 1-2-3 and Symphony to be loaded from the file server without key diskettes at the local workstations. An installation program creates concurrent use counters for 1-2-3 and Symphoto replace key diskettes, Continued on tope 130

MAN MEBON 3200 A TEER NO SENIA DEBTICULIONS CHIACESTIA NICHOLITUS INIF CHIACESTIA SENIA SENIA CHIACESTIA SENIA SEN

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DEPARTMENTS 16 Editorial

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Rejuvenated Multimate to target document use

BY DAVID BRIGHT version of its Multimate word

TORRANCE, Calif. - Ashton-Tate is expected to introduce next month a document-oriented

processing package for the IBM Personal Computer, according to industry sources Once one of the most popular word processing packages for microcomputers, the page-ori-ented Multimate has lately been surpassed by more modern, doc-

ument-oriented word processing programs such as Wordperfect orp.'s Wordperfect and Microsoft Corp.'s Microsoft Word uns, users can write con custy and scroll through an en-

tire document, rather than having to stop at each page Introduced in early 1983 by the Multimate package attracted a devoted following because of its power, speed and similarities

to dedicated word processors from Wang Laboratories, Inc., but the package is in need of reju-

> eeds a facelift As PCs become more powerful and are used for increasingly long documents, Multimate's

page orientation is becoming a drawback, according to Bruce Johnson, manager of the PC re-source center at Deloitte Haskins & Sells in New York, The company picked Multimate 21/2 years ago because of its clos-ness to the Wang systems.

Since the company now has sore than 1,000 employees using the package and may eventu-ally have 8,000 users needing word processing packages, it would be difficult to switch to a more modern package, Johnson

In addition, he says he wants to stick with Ashton-Tate because of its staying power as a major software vendor

Squeaky wheel... "If I holler loud enough and if I'm

constructive ecough in how I de-scribe what I need, they'll red," Johnson says, A change to a document orientation is the single most important change necessary, Johnson explains. Little more than two year

ago. Multimate International was challenging IBM for domina tion of the nucrocomputer word ssing market. According to IMS America Ltd., an Amb Pa., market research firm, Mul imate International garnered 12% of the word processing wholesale dollar volume of mi crocomputer specialty retail

stores during the fourth quarter of 1984, second only to IBM's Ashton-Tate bought the company and in the fourth quarter of 1986. Ashton Tate's share in

this sector was 9%, good for fourth place behind Wordper-fect, IBM and Microsoft. Senior Editor Ed Scannett

Unisys unites family

Sperry, Burroughs Unix systems placed in line

DETROIT - Unisys Corp. last 70% series. The third factor is week merged into a single prodcommitment, both to our cu uct family the Unix-based systomers and OEM vendors," said lerry L. Betersen, Unisys, vicev offered by Soerry Corp. and Burroughs Corp. president and program general manager of entry-level and debefore they joined to form Un

Under the merging, Unisys is renaming the two former Bur roughs XE 500 models with the 5000 series nomencla by Sperry for the lower half of its nix product line. Unisys also of fers the 7000 series of form

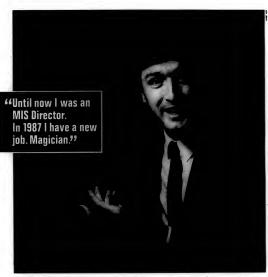
Sperry systems at the high end.
"In structuring the Unisys Unix product family, three major factors were considered. First was completeness of productine. We now serve a wide spec trum of customer requirements

up to 240 users.
The second factor was bran ognition. Sperry invested vily to establish marketplace awareness of their 5000 and Merging XE 500s With the move, Unisys is incor-porating the Burroughs XE 500-

and XE 500-5 into the middle of the 5000 product line as the 5000/70 Models A and B.

Unisys said the 5000/70 is a coupled architecture best suited for many users run-ning a variety of applications that Unisys said the products from

Sperry and Burroughs use com patible versions of AT&T Unix System V, Version 2 and can use compatible software packages,



hiring freeze here. A leaner budget there. And the work still has to get done. The message from corporate management is loud and clear. Do more. But don't spend more. You know what? Thousands of

tou know mark! Housans of companies like Marriott Corp., Singer Co., Inc. and Becton Dickinson's Descret Medical Division have MIS Directors who are working magic—doing more without spending more. Using the same people. And the

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to learn how.

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Shortages soften demand for Token-Ring

BY PATRICIA KEEFE

and for IBM's Token-Ring network has softened, according to dealers, consultants and some Both the Token-Ring Adapt and Adapter II cards remain in short supply, and major pieces of IBM's strategic network are not slated to ship until the third

Users said they are still inter ested in the Token-Ring, but many who need to link their computers today - particularly those in multivendor shops — are installing Ethernet instead. patible equipment but is avail-able now, observers said. As IBM spokesman m

tained that sales of Token-Ring cards for personal computer net-works are going like "gangbus-ters." subsequently slowing deters," subsequently slowing de-liveries. Still, the cards are available under a "normal" de-

h demand questioned ny resellers and analysts stioned IBM's claims of high aand for the Token-Ring. When the Token-Ring first came out, there was a panic magic there. Users have had a chance to look at things and they've realized that either one [Token-Ring or Ethernet] will " said David Terrie, editor of Patricia Seybold's Monitor" newsletter. "Network

he added. Based on a recent user s vey, Terrie said he expects Eth-ernet to outsell Token-Ring four to one this year. "Bridge Com-

LAN batting averages
PC networks shipped in 1986 and total installed base



EXPORMATION PROMIDED BY INTERNATIONAL DATACORP

They've discovered that Toications, Inc., Unpe ken-Ring does the job, just like Ethernet, But Ethernet has the Base Inc. and other token-ring vendors don't expect token-ring installed base, the range of mesales to total more than 10% of dia and supports [Transmission Control Protocol/Internet Protheir sales this year." He said he ects Ethernet to outsell Totocol). If you want a multivendor solution, Ethernet is really the ken-Ring for the remainder of the decade. Aithough IBM has repeatedly

said its Token-Ring network is in high demand, International Data Corp. (IDC), a Framingham, Mass-based market research firm, estimated that in its first six months on the market, only 1,200 Token-Rings were installed IBM maintained the To-ken-Ring began shipping in March, but IDC said it began shipping in volume in June. "That puts the Tokeo-Ring sixth in 1986 market share, even be nd IBM's PC Network." IDC

analyst Doug Gold said. A Computerland Corp. dealer said that although Computerland views the Token-Ring as a strategic product, less than 10% of the franchisees have ordered the network in the last 90 days.

I have heard the Token-Ring is in short supply in recent meet ings with professional groups and clients," added Ronals Brown, a technical consultant for

CORRECTIONS

ware as one of the founders of the Microelectronics and Computer Technology Corp.

option" [CW, March 9], listed an incorrect U.S. dollar equivalency for the West German price of the The correct company is BMC NAS AS/VL 50. The correct fig-Industries, Inc., located in St.

"You just can't get the partner at Brown & Associates in Belmont, Mass., a network systems integrator. He said just four of his 100 network installas use the Token-Ring. They are in terribly short "said an executive for an-

other major computer retail chain, adding that he is in a "severe back-order situation" for the Token-Ring, forcing his franchisees to turn to other networks that they have in stock He said he has been unable to get any explanation from IBM concerning the cards' availability

Demand slow to build Demand for the network has been slow to build, according to Laura Peck, a network analyst with L. F. Rothschild, Unterb Towbin in San Francisco, "IBM is still telling customers they will have to wait, whereas if you go with Ethernet, you can get all you need today," she said. And Fortune 1,000 users are

16-MHz Token-Ring card to re-

place the current 4-MHz card.

which has been criticized for its

omputer from IBM.

80386 computers

having problems with the inabil-ity of the Token-Ring to link microcomputers to minis or mainframes, according to a recent report from Forrester Research, Inc. in Cambridge, Mass. Those connections to IBM's mid-range and high-end systems are slated to be released between June and

eptember, according to Claire Fleig, research director for the International Technology roup, a market research firm ed in Los Gatos, Calif. "Demand has outstripped supply because IBM isn't making very many cards," another analyst said. "They are purposely staying behind the demand curve." IBM has talked about a

COMPUTERWORLD

performance. "IBM probably isn't making many [4-MHz] cards in anticipation," one connotive Feature nation people of the group's politicipants such at the CWLI group, complete in our force better allege the lat source said the 4-MHz cards may not be compatible with a 16or 12-MHz Intel Corp. 80386-1871 To A Comparison of St. M. MATTER.

1872 March Mar IBM is also expected to put a Token-Ring chip on the motherboard of its next generation of computers. Several sources said they have seen a Token-Ring thip on prototypes of IBM's

when the property of the prope Pathot Pf Books William Mattern Pathot Pf Browney Et N VXVIX in mercent Grapos WSS GENIA Internal Pf Bot San Manualer of the Pf Bots

AT-compatible system boasts removable drives

BY DAVID BRIGHT

NEW YORK - Promoting "a computing environment to go,"
Tandon Corp. introduced last
week an IBM Personal Computer AT-compatible system that can hold two proprietary, removable 30M-byte Winchester

Calif.-based company said the firm will also sell the drive subsystem separately as a peripheral for AT systems. According to Tandon, the 31/2-m: Personal Data Pac drives

are extremely rugged and can be moved or shipped without dam-You can back up 30M bytes

in less than three minutes and put an entire-corporate data base into your briefcase," President Chuck Peddle claimed. The shock-mounted drives, sch containing four drive heads

and two platters in an airtight enclosure, can be dropped from a height of 18 inches without internal damage, according to

The drives reportedly speed system performance with their relatively fast 40-msec average access time and through the use of data caching.

The Pac 286 system also includes a memory management scheme said to enable both new

and existing applications to adess the computer's maximum 5M bytes of random-access Existing applications would require a software driver, offi-

cials said Tandon said it plans to beg pping the products by late May or early June

Prices are not yet firm, but the company said it expects that Pac 286 system with one 1.2M-byte floppy disk drive and a built-in capacity for two dri will retail for \$2,995, along with

one Personal Data Pac. An Ad-Pac 2 subsystem with two drive slots may be priced as low as \$500, and each individual 30M-byte Data Pac may cost \$350, according to company offi-

"Chasing the bleeding edge of technology" [CW, March 16], in-correctly identified BMC Soft-Paul, Minn. The article "NAS shows 4381

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(2) EASY HÄNDLING: SYBACK and SyncSort CMS are among the most flexible, user-friendly programs ever produced by anybody anywhere. That's one reason programmers love 'em. And where does it say that backup and sort operations have to be hard to be good?

(3) "MISTER SOFTWRENCH" SERVICE: We've got the best pit crew in the business. More than 85% of all customer requests are resolved within 24 hours.

If you'd like to put a little high technology in your VM tank, give us a call. We'might even take your used VM dump-restore or sort program as a trade-in!





Vendors seek handle on TCP/IP

BY JAMES A. MARTIN

MONTEREY, Calif. - A task force consisting of several data mirations network vendors has agreed to pool its re-sources and work toward the development of a much-needed network management standard under the Transmission Contro rotocol/internet Protocol

(TCP/IP) 'Our goal is to provide focused vendor participation to achieve the shortest term, most useful results we can achieve in this area " said David H. Crocker, a software development man-ager for Ungermann-Bass. Inc. br deve and one of the eight to 10 task ternstional Standards Organizaforce members. tion's

The group held an inform meeting last week at the TCP/IP Interoperability Conference here to discuss an agenda. The task force comusts of representives from competing data Uogermann-Bass, Bridge Communications, Inc., Excelan, Inc. and Sytek, Inc.

As the size of data communi cations networks has grown, so has the number of incompatibil-ities in hardware and software

mterfaces, prompting a crucial need for standards in managing those networks, according to Daniel C. Lynch, president of Advanced Computing Environ-menta in Cupertino, Calif.

Lynch is a self-described "catalyst" behind the formati of the network management task force.

Interconnect (OSI) protocol to

Selecting the best The task force said its objective is to pick and choose among the various proprietary network nent protocols off by vendors and select the best in creating a network managefor consideration as a standard ment standard, Crocker said. The group confers with simi-developments within the In-

OSI is largely considered to to play a role in standards devel-opment, albeit an indirect one, be the next generation protocol beyond TCP/IP but is not exervers said. For example, the DOD is belping to fund several network mented until the early to mid-

In contrast TCP/IP is cur rently supported by more than 100 different systems and is widely used in government and commercial markets.

"We will definitely look at way standard could be one of several standards included in the development of an overall net-

talk to each other.

though they don't have any net-works to manage yet," Lynch said. "We want to make sure not to conflict with what they're doing, even though they aren't very far along."

Cooperate and contribute Although the OSI model is still in the future, the TCP/IP task force will not necessarily mandate what becomes standard forcing OSI later to follow. In fact, the goal of the group is to cooperate, follow and contribute

The Department of Defense which developed the TCP/IF protocol, turned over further standards development to the lowever, the DOD will contin

management research projects, including a gateway standard be-ing developed by the National Science Foundation. That gate-

dor basis," explained Steven F. Holmgren, president of Communication Machinery Corp. in Santa Barbara, Calif., and a member of the Netbios-TCP/IP interface task force With a standard created in

The task force has agreed to hold its first formal meeting this area," he said, "a PC Net en to any interested cor work application would be able on Netbios software to talk to nies - sometime in May. From other PC Network applications on different vendor bardware that point a commercial implementation of the standards may take two years to develop, ac-cording to Lynch. systems over the same net-

This particular cooperation During a four- to five-month period, the group developed Netbios-TCP/IP interface staning TCP/IP standards is not the dards, including how data param At the conference last week eters are determined and the translation of Netbios' naming a similar task force - formed last summer and consisting of rvice feature to an actual TCI IP address, Holmgren said.

At this point, the standard "needs some time to solidify," Holmgren added, "There will be standard interface between Net-bios. IBM's Personal Computer networking protocol, and TCP/ a four- to six-month period where users can test it out Once the standard proves to be a Eliminating roadblocks The Netbios-TCP/IP interface workable one, software companies such au Lotus Development standard will eliminate the road Corp. will be free to incorporate the standard Netbios-TCP/IP inblocks between communicating terface in uncoming software re-

from a microcomputer on Net-bios to previously incompatible are systems using the "Realistically, it would be two TCP/IP protocol, task force to three years before this atandard is used commercially," Holmgren said. "It will take a someone had PC Network, IBM's network package while to bring up distributed apning on Netbios, they could plications using the standard on only use it on a vendor-by-ven-

IBM end-run FROM PAGE 1

The key advantage of the new 3270-style operating system will be multitasking and the ability to ers and helping them plan for the run on machines other than the move toward the more complex 3270.PC "It will become usable for all

M executives were not PCs," a source close to IBM said. available for interviews as of "In its first release, it will sup-

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et six to seven PC-DOS tasks. However, Jerry Schi Each of these applications can who serves as president of the Capitol PC Users Group in The 3270-style operating Vashington, D.C., said the design of the Microsoft operating

tem also will reportedly pro vide virtual capability. For ex ple, if a system only has 640K bytes of random-access memory (RAM), the operating system will treat disks as RAM and thus provide more than 640K bytes of RAM

IBM's version of protected-mode DOS is semipro-1986 to 1988 prietary in that its graphical user interface will be avail able only on IBM PCs, a

This unterface, dubbed "dirty windows," provides windowing and multitask-ing. If software developers write software to take ad vantage of dirty windows, the software will run only or IBM machines.
This interface may also

source close to IBM said.

serve as the graphical user-interface component of IBM's The issue of dirty windows has touched off a behind-thescenes debate

'Not proprietury'
A Microsoft official argued last week that IBM's graphical user

interface would not be propri-etary and would not force software developers to write specifically for IBM machines.

tem provides for proprietary extensi The way ADOS lone name

for the protected-mode operat-ing system) is set up is to be a

The end-user version of New DOS from Microsoft is expected to be generally available in the first quarter of 1988. Availability may vary fro anufacturer to manufacturer

because the manufacturers license the version from Micro soft, New DOS product manager Mark Mackaman said last week

mainframes.

Major DOS developments

which allows it to plug in whatev-

er pieces are necessary to cus-tomize for the individual OEM,

zed for the had

Customized for OEMs

the OEMs," be continued

management standard.

petitors in develo

competing vendors -

bers said.

nounced the development of a



at The Chicago Association for Microcomputer Professionals Conference and Vendor Fair. According to Michael Goulde, an analyst with The Yankee

Group, a Microsoft official told him last November that IBM, not Microsoft, would formally "Most of your functions and drivers are in call libraries; those announce the operating system call libraries will be specifically He said the official told him that nent was expected in the first quarter

COMPUTERWORLD

MARCH 23 1987

Oracle set to leap 640K RAM barrier

BY DOUGLAS BARNEY

BELMONT, Calif. - Oracle Corp. next month is slated to announce Professions Oracle, which the firm claims will include all the functionality of Oracle Version 5.1, including the ability to run on mainframes and address more than 640K bytes of rancess memory (RAM), but which will still run under IBM PC-DOS and Mi oft Corp. MS-DOS 3, 1,

Oracle Professional uses the so-called stected mode available on more advanced personal computers, which allows RAM. Protected mode has been largely untapped, however, and the industry has been anxiously awaiting a new protectedde operating system from Microsoft, but that system may be as much as a year

Oracle refuses to disclose the means of addressing protected mode while running r the current versions of PC- and MS-DOS, but several schemes are cur , including Softguard Syss, Inc.'s VM/386, Metaware, Inc.'s C Compiler and Sapien Software Corp.'s Sa-nien VR. Software recompiled with the

cluding Ansa Software Corp., are looking at ways of running their applications in protected mode without waiting for Mi-

crosoft's new operating system.

According to Oracle, Professional Oracle provides the functionality of its mainframe package, including distributed data base capability, a query optimizer, comchensive security, the clustering of joined tables and high-speed relational

In addition, the package provides 500K bytes of RAM for users to develop

and execute mainframe data base applications using existing PC compilers and software tools. The package is also compatible with IBM's DB2, allowing DB2 applications development to take place or

Oracle is also scheduled to announce Networkstation Oracle, a product that runs on Intel Corp. 8088-based PCs and connects PCs to departmental and corpo-rate computers. The product allows PCs to serve as distributed applications processors and can execute applications while accessing mainframe data by In addition, Oracle is scheduled to an-

nounce Lanserver Oracle, a product that turns Intel 80286- and 80386-based systems into multiuser data base machines. the firm claims.

Dhase suit hits Ashton-Tate

BY DOUGLAS BARNEY

PACIFIC GROVE, Calif. - The legal bat-

tle between Ashton-Tate and Queue Associates, Inc. reached a feverish pitch last week when Queue announced it had filed suit against Ashton-Tate seeking rights

Queue, a software developer, is cur-rently being sued by Ashton-Tate for the alleged misappropriation of proprietary

This was an anticipated defensi strategy," said Ashton-Tate general

counsel Stanley Witkow. As of press time Ashton-Tate had not been served with Queue said its claim stems from a de-

velopment agreement the firm reached in 1982 with then-Ashton-Tate executives rid Cole, Hal Lashlee, George Tate and Wayne Ratliff. Under the origina eement, Gary Balleisen, president of Queue, was to develop an integrated soft-ware application, but Ashton-Tate instead acquired the rights to sell Frame work, an integrated package from Forefront Consulting, Inc., a source close

Instead of completing the integrated package, Balleisen began work on Shrink, a product that works with Dbase and provides graphics, cross-tabulation, report ing and analysis capabilities.

g and analysis capabilities. According to Queue, the software was delivered to Ashton-Tate, and Ashton-Tate failed to respond in what Queue called a "timely manner." Queue argued that the contract stated that if Ashton-Tate did not market the product or ac quire Queue within two years of the prod act's delivery, then Queue had the right to der an offer in the amount of the prod act's development cost to obtain the rights to Final Software (a combination of Dhase III and a reporting and analysis Dhase add-on package), including the nonexclusive rights to Dhase.

Queue claimed it offered Ashton-Tate \$1.7 million for full rights to Shrink and nonexclusive rights to Dosse III. As a re-sult of Ashton-Tate's refusal to take the offer, Queue claimed that it has a legal, nonexclusive right to market Dhase III and an exclusive right to market Final ware. Ashton-Tate strongly denies that argument

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VM link called stopgap move

But allows MIS support for swelling CMS sites until VM/XA arrives

BY JEAN S. BOZMAN

IBM's recent move to link large scale VM/SP systems together ough its VM Inter-System es (VM/ISF) product is viewed by industry analysts as a stopgap measure to allow MIS

support for growing numbers of VM/CMS end users. However, it loaded CMS sites until a more functional version of VM/XA functional versus to that includes CMS support is re-VM/ISF was an

nounced in late Ja ounced in late January with Au ast delivery. MIS manager had on way to support more than 1,000 VM/CMS users under a single copy of VM/SP. Adding more IBM mainframe hardware d not help, since it is the VM SP operating system that defi limit of little more than 1,000 virtual machines under

Users supported doubled With VM/ISF, IBM has effect tively doubled the number of us-ers supported. VM/ISF provides a software link between two IBM trainframes under VM/SF HPO Release 4.2 provided the computers are also linked by a -channel adapter or an IBM 3088 channel communica-tions unit, VM/ISF boosts sys-

tem support to about 2,000 end In order to reap the benefits of ISF, users must trade some VM functionality in the process, IBM says. The resulting computing complex, company spokes-men say, does not provide a true single-system image. For this

Language/Data System and Interactive System Productivity Facility. For such applications IBM suggests users concentrated on the particular system where the application exrestrictions on VM/ISF configu ration. The machines to be

VM single system image VM Inter-System Facilities links mainframes



eason, important VM applicaons might not perform well in a M/ISF environment. Among the applications that night suffer performance prob-ms are IBM's Professional Office System, Structured Query

linked are high-end systems from the IBM 4381 up. VM/ISF will not run on IBM 4341s, 9370s or older 370s. Furthermore, only two CPUs may be linked at a time - not three.

"This product was targeted at users who have already ched the largest possible VM configurations. says Frank ens, a vice-president and senior analyst at International Data Corp., a Framingham,

Mass market research firm But it's just a partial solution for righ-end VM users. [The version of VM/XA [with CMS support] is late even by IBM's own expec-tations, and VM/ISF is really a gap-filler for large users until M/XA arrives Until that happens — report-dly, a year or more from now —

MIS will have to turn to VM/ISF as a practical stopgap measure for VM/SP applications support observers say. Possible applica-tions for VM/ISF include information center queries and the distribution of shared files over It is the kind of relief that IBM's largest VM customers have been demanding for several years, analysts say, "IBM's largest customers forced the an

nouncement out," says Peter Levine, a vice-president at the Gartner Group, Inc. in Stamford, Conn., which specializes in IBM software systems analysis. "But it is only another small step toward a single point of system definition and system manage-

VM/ISF works by updating

source directories on either side of the link, IBM says. "Updates ries occur almost immediately,

an IBM letter to custo states, through use of the VM In-ter-System Directory Synchrotion feature. For some uses, though, there is apparent single-system image. VM/ISF provides a full directory of all users on the system, the ability to pass files hack and forth over the link and the ability to broadcast VM's Control Program commands throughout the system.

will have to provide single-sys tem image capability for various configurations of multiple systems under VM/XA. In or that would mean IBM sense, that would mean IBN would allow users to cluste mainframes in much the same

way that Digital Equipment Corp. allows users to cluster multiple VAX systems. kind of single-system image may sted under future relea of VM/XA, allowing MIS managers to forge a variety of large scale mainframes into a single IBM has also indicated that it

aiming to support larger VM/ CMS populations in the future. "VM/ISF is a step toward achieving a single, larger system environment for the end-user community," IBM says in a product letter on new VM releases. Comparable single-sys tem image capabilities are not widespread in the IBM world, with the exceptions of single-im-age data bases under IBM's Airline Controls Program operating system and a system solu CMS Unlimited, Inc. in Boston

Bigger 3B2

for an enhanced small device in-terface; and a 60M-byte cartridge-tape backup, AT&T and other sources said. A base configuration is expected to cost been \$45,000 and \$50,000. However, several analysts waxed less enthusiastic over the 3B2/600, saving it does not stack up against the competition

"AT&T has a big psychologi ment in the 3B line, so it doesn't surprise me that there's yet another version of that machine," said David Ter-rie, editor of Patricia Seybold's "Network Monitor" newsletter.
"But just what it brings to mar-ket is nothing. Who's going to buy a 3B2 when [it is competing] with NCR Corp 's Tower line he asked, suggesting the Tower line provides better price/per-

second analyst close to AT&T agreed that the 3B2/600 is too expensive for the perfor-mance it provides. He said that the 3B2/300 was a superior machine when it was introduced years ago with the WE320100 chip. But in the intervening years, the competition has upgraded to Motorola, Inc.'s 68020 and Intel Corp.'s 80286 and 80386 processors. Meanwhile, the AT&T shipped the 3B2/400 with the same chip, power and speed at a price in-crease of \$20,000. The 3B2/600

will reportedly use the same chip, although it features a faster clock speed. "It's a modest in om three years ago," he

Communications is still key for AT&T. LU6.2 compatibility is

being provided in direct ree to customer pressure AT&T insiders asserted. Load-ed into a 3B2 file server on a Starlan network, LU6.2 could vide users with a gateway to an IBM Systems Network Archi tecture (SNA) environment. AT&T will also reportedly

take steps to beef up its Starlan marketing efforts, including ickaging the 3B1 and/or the 6310 with Starlan as a file serve and extending the range of that twork, sources indicated Also slated for tomorrow's New York press conference are

statements concerning AT&T's strategic plans for connectivity and the Intel 80386-based envirooment, informed sources said

In addition, AT&T will reinforce its commitment to the computer industry, several red AT&T resellers noted AT&T had on major compute hardware announcments lost year, mostly shipping products

Edwards leaves AT&T

James D. Edwards has bailed out of AT&T's troubled Data ystems division to head up Telwatch, Inc., a Boulder, Colo., communications equip ment company

Edwards' most recent ich at AT&T was planning for future delivery systems. He was replaced as vice-president for strategic business and market planning last year by Vittorio Cassoni, formerly of Ing. C. Obvetti & Co., man

ufacturer of AT&T computer equipment. "The computer division slid after Edwards took it over in '83. You could argue it was going down any-way, but he couldn't turn it around," said Daniel J. Rosenbaum, executive editor of tracks ATAT

announced in 1985. This, coupled with a state-ment of direction focusing on munications and not standalone computers in the fall, led to eculation that AT&T would

three-month period fat point]," said one reseller, adding that be lost contracts becau rs "didn't want to be ass ated with a loser However, in the last month sales have picked up - in part due to AT&T's February unveil-

ing of the 6310, a true IBM Per-sonal Computer AT compatible. The 6310 just began shipping this month, but ad resellers said its introduction was buried in a multiple-product unveiling. To focus attention on the 6310, AT&T will include it in tomor

6310's AT compartibility
The 6310's importance lies in its
AT compatibility. AT& I's earlier
80286-based offering, the
6300 Plus, had a different bus

structure and could not accept many AT-compatible add-on boards, thereby inhibiting sales. What users will not see is an AT&T-labeled 80386-based nputer, even though AT&T

has an 80386 offering under wraps and Ing. C. Olivetti & Co., its supplier of personal comput-ers, has introduced an 80386sed box in Europe.

But AT&T has no plans to m troduce an 80386-based com-puter in the near future. IBM's pull out of the computer busin-ess. "Sales really dipped for a 80386 plans and the brisk sales of Compaq Computer Corp.'a Deskpro 386 are not issues at AT&T, informed sources said.

AT&T is still working out where the 80386 fits into its product line, especially since it

provides 32-bit processing today via its Unix-based 3B line. One tion its 80386 box as a net work file server "They are being very careful and the 386." the AT&T

esman said. "It hasn't been determined yet what the purpose of that machine will be. What are you going to do with it? It's not worth anything as a mul-timer box." AT&T is also trying to decide between two shell products that allow DOS to run der Unix: Locus Compi Corp 's Merge 386 or VP/IX, de veloped jointly by Interactive Systems Corp. and Phoenix Technologies Ltd. AT&T's 80286-based 6300 Plus has a ed version of Locus's

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Feds drop stormy data security policy

Revamped Reagan administration backs off from controversial Poindexter initiative

BY MITCH BETTS

WASHINGTON, D.C. - The Reagan administration, under pressure from Con-gress, announced last week it will back off its controversial computer security policy, which is aimed at cutting off foreign access to sensitive data in U.S. data bases. The surprising turnsbout came in reonse to months of criticism that the administration's policy was a new form of military censorship [CW, March 2].

At a hearing held by Rep. Jack Brooks (D-Texas), as (D-Texas), administration officials said they will rescind an October 1986 policy memo that triggered the latest round of controversy by broadly defining the new egory of "sensitive but uncl national security information. In another reversal, the administration

Agency (NSA) in shaping data security Despite these moves, the administra-

said it will support legislation that would reduce the role of the National Security

tion's critics were only partly molified Sookesmen for the Information Industry Spokesmen for the Information Industry Association (IIA) and the American Civil Liberties Union called the changes a step in the right direction but cautioned that erlying government policy — Na-Security Decision Directive (NSDD) 145 - is still in effect.

White House change of heart The conclistory approach toward Congress was arranged by the new White House staff, particularly Chief of Staff

Howard Baker and National Security Adviser Frank Carlucci.

NSDD 145, issued by President Reagan in 1984, gave the NSA, the Department of Defense and the president's national security adviser the key roles in shing data security policy and standards. It also created the sensitive but unclassified information category.

At recent congressional hearings, critics from many segments of the computer community said NSDD 145 gives the NSA and the military too much power over information policy. The critics in-cluded the IIA, the American Bankers Association, the Computer & Communica-Institute of Electrical and Electronics En-

NSDD 145 rem ins in effect, but the administration said it will support legisla-tion sponsored by Brooks to transfer some authority from the NSA to the Natain amendments can be made. Last year, lobbying by the Pentagon helped defeat

the bill Speaking for the administration at last week's hearing, Secretary of Commerce Malcolm Baldrige said the administration welcomes Congress's interest in comput-

er security and is trying to address legiti-mate concerns about NSDD 145. For starters, Baldrige said that the controversial policy memo issued by for-mer National Security Adviser John Poin-dexter will be rescinded. That memo defined sensitive but unclassified information to include economic, business and scientific information that might harm national security if disclosed and re-quired federal agencies to implement security programs to protect it.

Poindexter, forced to appear at the hearing by a congressional subpoens, refused to answer questions about the computer security policy. He cited his Fifth Amendment right against self-incrimination and, according to his attorney, was concerned that questions might delve into his role in the Iran arms-sale scandal. A former Poindexter aide, Kenneth de

Graffenreid, defended the policy as neces Graffenreid, detenued to pour, sary to keep sensitive data stored in government computers out of the hands of foreign spies. De Graffenreid also said the policy was not intended to affect the pri-

id the administration will view NSDD 145 "to resolve any amb guities" about the role of the national security adviser. Carlucci went a step further in a letter to Brooks, suggesting that the national security adviser's role be Baldrige said that the challenges of in-

formation policy will require broad coop-eration among government bodies and the private sector. "It is the intent of this administration to promote and foster that cooperation to the fullest possible ex-The administration's new posture in

creases the chances that Congress will pass a bill similar to Brooks' proposed Computer Security Act of 1987, also known as HR.145. That act would give the NBS, part of

the Commerce Department, the author-ity to develop security standards for civil-ian agencies and the private sector, leaving the NSA to handle computer systems in the military and intelligence communi-

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STELLA

Tandem DBMS to recover data after system failure

BY JEFFRY BEELER

CUPERTINO, Calif. — Tandem Computers. Inc., as expected, last week announced a relational product that allows distributed data base transactions to be recovered following systems failures.

Nonstop SQL. a relational data base management system that supports the Structured Query Language on Tandem's fault-tolerant systems, will not be available to the systems of the systems.

able until the third quarter, but testing is slated to begin late this month at one of several beta-test sites.

ITI, Inc., a Pennsylvania-based software house, installed the Tandem product last week and will begin tests next week, according to Phil Landau-Smith, ITI software architect.

ITI software architect.

"We expect the Tandem system to reduce significantly our application development and maintenance costs," Landau-Smith said. "With SQL, we won't have to

write a separate piece of code every time a particular application needs access to a different file." Fiscal year ended Sept, 30

cess to a different file." Fiscal year ended Sept, :
According to Gerald
Peterson, Tandem's
vice-president of marketincludes the relational product "is more than a re-

uct "is more than a rehash of our existing Encompass data base system."

Tandem said that

Tandem said that more than 75 man-years went into developing and testing the file management system, applications generator and others.

Tandem wrote from scratch to produce the 700,000 lines of code in the product.

A chief feature of the product, Tandem pointed out, is its purported a ability to update distributed data bases and protect them from systems

failures.

By distributing data
bases, financial institutions "could minimize
their liability during disasters and improve their
local control," notes
Charles Savage, opera-

wattern tions vice-president for Gueranty Bank & Treat Co.'s data processing organization. Under Nonstop SQL, the table that forms the basis of all relational systems can reportedly be partitioned and distributed among dispersed sites, with each node in the accompanying network transparently accessible by all of the other

nodes. Tandem's reported ability to recover aborted transactions in distributed data bases has eluded all other relational data base management system and SQL suppliers, according to E. F. Codd, originator

of the relational model.

Tandem explained that it overcame this stumbling block by integrating Non-stop SQL with its existing Transaction Monitoring Facility, which automatically keeps track of all processing activities within its systems.

within its systems.

Nonstop SQL is priced from \$4,000 to \$8,000 per processor for an initial license fee. There is a \$375 to \$750 monthly charge.

Nolan Norton merges with Peat Marwick

BY DAVID A. LUDLUM

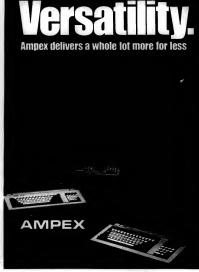
Peat, Marwick, Mitchell & Co., one of the nation's largest accounting and management consulting firms, has merged with Nolan, Norton & Co. a leading information technology consulting firm.

Under the agreement, signed March 13 and announced last week, Pest Marwick will arquire the assets of Nolan Norton, which will maintain its indentity, leadership and focus, according to officials. The companies did not disclose financial terms.

Nolan Norton, which has more than 100 professionals, will work in partner-skip with Pest Marwick's Information Systems Services division, which is composed of about 700 professionals. The two units will not compete with each other, and Robert D. Gilges, managing partner of Pest Marwick's Information Systems Services consulting practice.

Nolan Norton colouder Exhault.

Notin Norton colounder Richard L. Notin said Peat Marwick's capabilities in systems development will let Notan Norton extend its services beyond planning to implementation. The 21 principals of Nolan Norton will become partners of privately held Peat Marwick.



Foes fill vacuum created by Uccel support bailout

BY JAMES A. MARTIN

Although Uccel Corp.'s recent decision to discontinue support for The Cambridge Systems Group, Inc.'a mainframe sched uling package may have been bad news for many users, other software companies are rushing in to woo those disgruntled ers with special support guarantees and

ng discoun Uccel's action is comparable to an an-nuncement from Lee lacocca that Chrysler Corp. is "closing all of its repair ers and offering the Chrysler owner an opportunity to exchange his automo bile for a Sherman tank," says James P Williams, president of Southwest Soft-ware Services. Inc. in Dallas.

As a result, Southwest Software said last week it is now offering a written guar tee that its products will be supported regardless of an acquisition or merger
 for five years from the date the user

"Bollout" offered The five-year guarantee is part of South-west's "ADC2 Balout Program" and will retreactively affect the installed base of 400 for the firm's Zeles scheduling pack-age. In addition, Southwest Software is offering Automated Data Center Joh Scheduling and Production Control (ADC2) users the chance to convert to Zeke for \$8,000 a year in maintenance

costs for a three-year lea Another former ADC2 con INDUSTRY NOTICE ALCZ competitor looking for market exposure is Bennett Software, Inc. The Houston-based software firm is offering, until May 1, a 25% discount and conversion assistance for ADCZ users to switch to its Job Trac scheduling next reason under IBM² AVEC.

iting package under IBM's MVS. mett Software is altering its cus tomer sales contracts to state that if the company is acquired or declares bank

ruptcy, the source code for its products will be placed in the public domain. Some of our prospective clients have shown concern because we are a young w and there are acquisition war

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ard as we try to give our readers the ost complete information available, one good news and feature stories

Are you involved in an unusual ap-ication of DP technology in your impany? Have you implemented sucsaful cost-cutting strategies? Is mething in your DP shop not work-

ing as designed?

If so, we would like to hear from you. Computerworld has established reader but line for information regard. ing items that are of interest to the

enputing community. Call us toll free at (800) 343-6474. Asic for Computerworld's Hotline Edi-

We can't be everywhere - but our

under way," says Jerry Bennett, presi-dent. "We're assuring our clients and cus-tomers that if Job Trac is removed from the marketplace, for whatever reason, the source code goes into the public domain. That way our user group can main-

vest Software's Zeke is said to be similar to Cambridge Systems' ADC2 package in that both IBM mainframe schedulers run under MVS and MVS/XA and offer ease-of-use features. The fiveyear support guarantee applies to all of Southwest Software's other products as

Uccel recently told ADC2's in base of 130 that support will be phased out by December 1988 so that the rms can focus on UCC-7, a pack

age from Uccel (CW, March 9), Uccel ac-quired Santa Clara, Calif.-based Cams in December 1986 cel said it did not seek to s eliminate a competitive product when it acquired Cambridge, adding that the firm will also discontinue support of its own

will also discontinue support of its own UCC-3 mainframe disk-management sys-tem in favor of Cambridge's Automated Storage Management package. Anticipating the ire of users, Uccel is offering ADC2 users a free conversion program to UCC-7 basic or a significant discount for a UCC-7 full-function up-

ide until April 30.
"ADC2 and Zeke are state-of-the-art packages designed for an interactive envi-ronment," Southwest Software's Wilronment," Southwest Software's Wil-lams says. By contrast, he adds, UCC-7 was introduced more than 10 years ago in the "batch processing age." Williams says one of Southwest Software's goals in of-fering ADC2 user incentives is "the mar-

tering ALP.2 user incentives is "the mar-ket exposure it will bring us."

Bennett says that although his firm's job Trac installed base is small — about 30 — the company expects eventually to have a large user group that would be able to support the product should bankruptcy

"Firms must appearse customers"
"This is all unusual, but it's also a reflec-tion of the flux in the industry today," Maureen Pleming, editor of the "Soft-ware Industry Bulletin" in Stamford, Conn., says. "Companies are going to have to appease customers that these kinds of problems will not happen in the

The guarantees and offers are not as new as their sudden importance as a mar-keting concept, according to David B. Sturrevant, senior director of public comcations for ADAPSO

At this point, no one is a ssful these incentives will be. "If 10% to 20% of current ADC2 users go to an-other product besides UCC-7, I'd be sur-prised," Bennett admite.

However, there are devoted ADC2 us ers who are not so sure they are going to give up, regardless of what Uccel or any-one else offers. "We can run ADC2 until it can no longer run," says Rod Chatfi specialist for production services at G eral Electric Co.'s Nuclear Energy Divi-sion in San Iose, Calif. "When that hap-

pens, then we can decide what to do

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Combac - A GOOD PLACE TO PUT YOUR INFORMATION

Firm says 32-bit chip handles 17 MIPS

BY JAMES A. MARTIN

SAN FRANCISCO - Advanced Micro Devices, Inc. (AMD) announced last week that it has designed a 32-bu CMOS micro-processor that can process an average of 17 million instructions per second (MIPS), a speed which AMD claims will "leapfrog" over all existing 32-bit chips.
The AM29000 is "the most significant product" AMD beautiful and a significant product.

product" AMD has introduced this decade, according to Tony Holbrook, president and chief operating officer. Because of its speed, the chip will not compete di-

rectly with other 32-bit microprocessors such as Intel Corp.'s 80386, Holbrook ad. Instead, the AM29000 will be the first of a new generation of high-speed reduced instruction set computer micro-processors, and the use of CMOS technology will reduce power consumption of the devices, he added.

The AM29000 will be aimed at ven dors specializing in Unix-based engineerlaser printers, network protocol control-lers, network communication switching systems and robotics, among others. Because the high-speed chip will not be

said it was premature to disclose the nature of any talks with hardware or soft ware vendors interested in designing products around the chip. The AM29000 still include software compilers for C. Fortran and Pascal languages, he added

'Represents evolution'
AMD's announcement "represents the
continuing evolution of the semiconductor industry," said Mei Thomsen, a semi conductor analyst with Dataquest, Inc. in San Jose, Calif. "It shows we are learning more about the architecture of chips, and

their announcement is very impressive in terms of speed and performance." The AM29000 features 192 ge

purpose register files, more than any oth-er existing 32-bit microprocessor, the company said. The expanded register file mizes the cycles required for access ing external data. In addit AM29000 offers 40-nsec cycle time and an on-chin memory management unit and supports software for real-time and multi-

sking operating systems. AMD, which began desig AMD, which began designing the chip in 1984, said it expects the AM29000 to rate some \$200 million in revenue by

1990. The company desperately needs a strong flagship product, and the AM29000 family will be positioned to be just that. AMD recently reported a net oss of \$92.5 million for the three fiscal 1987 quarters reported so far.
"AMD might seem like the last kid on

the block with a 32-bit microprocessor," said John East, vice-president of AMD's general logic group. "In reality, we're the first kid, but on the next block."

RCA to spruce voice package

BY ALAN J. RYAN

MORRISTOWN, N.J. - RCA Corp.'s Advanced Technology Laboratories has signed a pact to integrate Verbex Voice Industries Corp.'s Verbex continuous speech technology in its research and deent projects.

RCA engineers will reportedly en-hance and extend the technology for voice interface to complex government and mil-itary systems applications. "They have a staff of people in the speech lab and in the artificial intelligence lab, and their charter is to develop and enhance the voice recog-nition as well as other elements of artificial intelligence for various government projects," said John Ferretti, vice-president of sales and marketing at Verbex. Some of those projects are for the National Aeronautics and Space Administration, the Department of Defense and applications that are relevant to the military, he

Before formulating the deal, RCA had worked with Verbex's products in its Moorestown, N.J., facility. "They were using it in their AI lab and decided that there was enough in the base technology for their specific applications . . . that they wanted access to the technology it-

self," Ferretti said.

The Verbex 4000, which is currently rketed by Verbex, is an industrially hardened unit, or one that has been deed specifically for industrial environ ments, Ferretti explained. It has a maxi-mum vocabulary of 100 words and works on continuous voice recognition but is speaker dependent:
"The algorithm is particularly so

to noisy environments. A great deal of work was done to fine-tune the algorith to distinguish noise from valid words or utterances." Ferretti said.

The Verbex product is basically an RS-232 peripheral. "It has an asynchronous uter with an asynchronous ons protocol," Ferretti said



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DUQUESNE Systems 412-323-2600 in PA

IBM display interface tops slated graphics show rollouts

BY ALAN J. RYAN

PHILADELPHIA - In a move that may help establish the graphical kernel system (GKS) as a standard, IBM is expected to uners of its Graphical Data Display Man-ager (GDDM) mainframe graphics sys-tem at the National Computer Graphics Association's (NCGA) Computer Graph-'87 conference and exposition

this week.

Developed by Uniras, Inc. in Copenhagen and Dallas and IBM UK Laboratories.

Ltd., the applications programming interface was first announced by IBM at Cebit '87, the international technology trade show held in Hannover, West Germany,

riser this month.

By using GKS, "I think IBM is perhaps legitimizing it somewhat in the mainframe environment by making it available through GDDM," said Reuel Warkof, a program manager at Uniras's Burlington, Mass., office. Uniras wrote the interface,

The interface allows access to the graphics components of GDDM, Warkof explained. He said GKS, a national and international standard for two-dam graphics, is a programming app option to GDDM.

Prime to add 3-D terminal Also expected to be announced at the NCGA show is a workstation with a three-

Prime said the unit will be targeted at discrete manufacturing, automotive and aerospace industries. Prime developed the product with Silicon Graphics. Inc. in Mountain View, Calif., and MIPS Com-

ountain View, Calif., and MIPS Countries Systems in Sunanyvale, Calif.

The PXCL 5500 workstation is time's first offering in an engineering/isentific graphics workstation product se, according to spokesman Paul Lafel. He said it employs Prime's implementation of AT&T's Unix System V.

nentation of AT&T's Unix System V, lelease 3 operating system. The unit reportedly incorporates a ghly optimized reduced instruction set computing processor and is linked to a raphics subsystem based on four custom and three semicustom graphics proces-sors, its standard configuration "provides ximum 3-D graphics performance by orporating 37 of these graphics pro-sors in parallel architecture," the

rime spokesman said.

One fully configured workstation can accommodate up to 12M bytes of main memory, 24 color planes that provide a palette of 16.7 million colors, four addinal bit planes for window management. pop-up menus, overlay and underlay func-tions, a 24-bit buffer for hidden surface moval and a variety of input and output vices, the vendor said. In its standard ofiguration, it sells for \$74,900.

Other expected announcements in-clude the 3308 Imageserver XP laser printing system from Imagen Corp. in Santa Clara, Calif., and two graphic dis-play product families from Ramtek Corp., also in Santa Clara.

Imagen's printing system, set to sell

for \$10,950, includes a laser printer marking engine, performance-optimised Raster Image Processor, host-to-net-work interface and system software. Shipments are slatted to begin this month. The system, which features 8 page/ min throughput, was designed for use in work-group environments of two to four users as a shared print resource, the vendor said. It is claimed to work with a vari ety of host devices through serial, parallel

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Avoiding chaos

BM is finally set to take dramatic action to recapture the control of personal computer standards that has been sliping away for the last two years. The industry is nervously awaiting an early-April announcement of new IBM Personal Computers that will be more difficult to clone because they will include proprietary graphics and communications.

tary graphics and communications.

The industry has reason to be nervous.

Any attempt by IBM to limit is PC architecture at this point is fraught with risk, not only for clone makers and PC buyers, but for IBM tiself. Millions of PCs, PC XTs and ATs are now installed. If IBM gives those users anything less than a clean migration path to its new machines, it will create a potentially devastating schism in the industry.

Unfortunately, we can't be sure IBM won't take that route. The company's track record of PC innovation has been mixed. The original PC and PC XT were, of course, smash hits, and the PC AT has continued the tradition of spawning new markets and imitators.

However, IBM has had its failures in the PC market. In addition to the flops — the PCjr and Portable PC — a host of other machines have fallen short of expectations: the PC XT Model 286, 3270-PC, PC XT/370 and PC AT/370.

These slow-selling products shared some basic flaws: They were either too expensive or incompatible with other PCs. For the company-totruly establish a new PC standard, we believe the machines must meet several basic criteria: 100% software compatibility. All exist-

ing PC-DOS applications must run on the new hardware with no modifications. 100% hardware compatibility. The PCs must in some way accommodate the millions of

installed add-on boards and peripherals.

Aggressive pricing. The IBM price umbrella must be folded. A machine that is based on Intel Corp.'s 80286 and priced higher than the current AT will not sell unless it delivers maior.

functional improvements.

An economical way to use 5¼-in. disks.
Corporations have distributed millions of templates and programs on 5½-in. media. IBM wants to move to the more advanced 3½-in. technology but must allow its customers to move with them.

A continued commitment to the 80286 architecture before an operating system that takes advantage of it becomes available sometime next year. To keep software developers developing and users using the PC AT, the company needs to keep enhancing it. Radical innovation and architectural changes should be made in the 80386, where IBM can still set standards.

Those who remember the agony users experienced moving from the IBM 1401 to the 360 architecture almost a quarter of a century ago will well remember the chaos that incompatibility can cause. A base of nearly 10 million fiercely independent users will not stand for a repeat performance.



LETTERS TO THE EDITOR

The 20 Questions

Regarding your article, "Ball filled to delay tax change" [KW, Feb. 23, about tax legalistion affecting independent contractors in the computer industry: The legalistion requires contractors to be employees of the broker that placed them only if the contractors cannot need certain standards. The standards was the standards and they are based on common law, and they are embodied in the Internal

Revenue Service's criteria for independent contractors, called The 20 Questions. This point is very important. One does not have to become an employee unless he or she cannot meet the standards in The 20 Questions. No one is at risk, not cliest, broker or contractor, if the contractor can meet these

Contractors in the computer industry have been exempt from the standards since 1978. All Section 1706 does is remove the exemption for contractors who work through brokers. That's all. It simply makes contractors subject to the usual common law standards for independent constructions.

standards

Michael Bradley Technical Writers Trade Group National Writer's Union Local 3 San Francisco

Cutting on the bias Your article, "Users back IBM

mid-range strategy" (CW, Feb. 23), reminded me of something that has been bothering me about your newspaper for the past couple of years. While it an industry consensus that your newsweekly is the most comprehensive, it is also the most bi-

ased. Your bias is against the vendor that most of your readers have installed — IBM.

There are many IBM customers who buy IBM equipment because it is the best equipment in the industry, not because IBM is a safe choice.

Take the 9370 for example. Now that IBM has announced a mid-range product that not only offers the best price/performance in the industry, but provides its customers with the widest compatible product line in the industry. Computerworld does not praise IBM with exame enthusiasm it criticizes. In-

same enthusiasm it criticizes. Instead, you search for something in the 9370 to criticize.

If you evaluate benchmark tests performed by the Argonne Labs, you will see that a 2.7 mil-

This week in history

March 21, 1977

Sens. Edward Kennedy (DMass.) and William Roth Jr.

(R.-Del.) introduce a bill to establish a computerised system for dispensing information on federal domestic
assistance programs to state
and local governments. The
proposed act would provide a
single source of current data

on federal grants and loans.

March 22, 1982

Product manangers reveal in a survey that data dictionary's function is expanding to encompass management of

the entire corporate data resource, rather than just the data in the data base management system. lion instruction per second (MIPS) IBM processor does more work in a specified period of time than a Digital Equipment Corp. 6.0 MIPS processor. Additionally. IBM maintenance costs are significantly lower than DEC.s. Maintenance on a 9370 Model 60 with 1,104M-byte direct-access storage drive. a tippe incertainty in the processor of the processo

tion and system software. Timetables can be set up to automatically update software releases on the 9370 and log those changes in a master log-This simple function can eliminate the No. I nightmare of a distributed network: software dis-

There is a lot of good that IBM is doing with its products and product strategies that you seem to ignore. Computerworld should concentrate more on the positive aspects of the computer industry rather than dwell on the

> M. C. Heiblum New York

IBM Japan, Superperformer, to the rescue

More powerful than an 80386 chip, able to leap tall competitors at a single bound . . .

CHARLES P. LECHT

On the cover of last month's To-kyo Today, an En-

unity, there is a large picture that suggests Superman — but this time "IBM" is writstead of the big of the center of the page - he's on the attack — and a group of cowering people are fleeing from The headline reads, "IBM Ja-

in to the rescue," but we don't now who or what is being res cued until we turn to page 16 and read the title of the lengthy article — "IBM Japan: Going to the head of the class." The class is the IBM corporate giant, head-quartered in Armonk, N.Y. Whether or oot IBM Japan is in fact rescuing the rest of IBM is debatable; what is not debatable is that IBM Ispan is an engr-

Lecht is chairman of Lecht Sciences Inc./Jagan. a Tokyo-based software think tank specializing in graphics. He is also an elected public member of the Madson Institute and a free-bace science writer

mously successful company, a superperformer by any stan-dard. In the race for supremucy in the world computer industry, IBM Japan is a highly perfected business machine with an un-

able track reco Since the end of World War II IBM Japan has repeatedly won the race for computer industry profits in Japan. In doing so, it grew to become one of the largest computer companies in the world. (Slightly under \$6 billion is the current estimate for fiscal 1986). That it lost market share to an ever-growing field of com-

peting Japanese companies as it grew is deceptive in its implications, in the beginning there was no competition at all. vernment subsidization It is an unquestionable fact that the growth of the home-based Japanese computer industry was

nurtured by the Japanese gov ernment, which wisely finance its constituents from the onset Thus, in addition to competition from the companies themselves. IBM Japan also had to content with the Japanese government's subsiduation of Fujitsu Ltd., NEC Corp. and Hitachi Ltd. The fact that there are ma IBM systems in Japanese gov-

they continue to be purchased despite the availability of homegrown alternatives speaks for the success of IBM Japan in prevailing against its government

This fact also confirms that the Japanese companies and their government sponsors have not noted as a unified force to unseat IBM Japan as its industry leader. The way Japanese comues deal with one another and their government gives us the purest meaning of the word

to he listed on the Tokyo Stock Exchange — selling its products. In the past two years, it That IBM Japan's record is created joint ventures with five what it is today, given the noholds-barred competitive envi-ronment in which it was achieved, is nothing short of mi-raculous. To become a believer, consider the last five years of clude the gamut of products sold in the U.S. and more. I say "more" because the IBM Per-

outright legal warfare between IBM and the leaders of Japan's According to revenue esti-mates for 1986 and stating all dollar amounts using the aver

age exchange rates for each year age exchange rates for each year starting in 1982 and ending in 1986, IBM Japan grew from \$1.9 billion to \$5.7 billion.

During the same time, the Ja-n unit's contribution to IBM's total corporate revenue rose

can he traced to the lack of "Ja-pan-mation" of IBM Japan's of-ferings and the marketplace characteristics of companies that acquire them.

For mod-range systems, IBM pan ranks fourth in installed se and fitth in minicomputers But for large mainframes, IBM on is now and has always been No. 1, commanding 32.6% of the stalled base; its closest ri ujtsu, holds less than 24% IBM Japan's success in this area that its management

placed its emphasis where it IBM Japan's 1986 sales were versely affected by the sudd increase in the value of the yen They remained essentially flat as the year wore on. 1986 was a

year of retrenchment in Japan so new capital expenditures for computer systems suffered as did sales for all manufacturers But 1987 is expected to show ajor improvement. People beheve that the yea has peaked, or. if it has not, that future increases

sonal Computer 5540, 5550 and 5560 systems, which are unwill be marginal. Tokyo Today a brisk sak growth of 10%." available in the U.S., are essenrior to U.S offerings

IBM Japan's spectacular per rmance, while the rest of col lective IBM goes on an austerity program to counter the business downturn, is trong. The market place Americans most criticias as closed to their businesses in proving itself as anything but for the IIS's flagship computer

Expert systems technology teaches the uses of artificial intelligence

EFREM MALLACH In 1896, George Santayana wrote that "the whole chinery of our are so many symalgebraic expr

They stand for experience ... which we are incapable of retaining and surveying in its multituler hopelessly, like the animals, did we not keep ourselves affoat and direct our course by se intellectual devices

Santayana was not referring to artificial intelligence as we use the term in computing nearly a century later. Yet his words are prisingly apt. An artificially great deal of experience as symbolic expressions and survey them in their "multitudinous im-mediacy," Managers dream that such systems may stop us from

puter science at the Boston College School of Management and a consultan the strategic and tactical deci son alternatives we face every

The question for MIS managers is not whether artificial intel igence will become a reality in their shops, but when. Al prom ises benefits and has risks, as does any emerging technology. Those who delay moving into Al because of the risks also delay the benefits. If they wait until the technology is fully pr competitors will reap its advantages. Leaving the gate when competitors are halfway down the course is as great a har in business as it is in athletics.

A way out of this dilemma is to find an initial application that lets firms get their toes wet in Al without significant risk. Some firms won't bet the factory on new technology but would try it on the seating plan for the annual company picnic. Between these extremes lies a happy medium in which success is meaninoful and re is not disastrous.

m technology. This aspect of maturity most rapidly. Reduced to essentials, an expert system consists of a knowledge base of facts, an inference engine to ork through the rules and a set of facts to which the infe engine can apply the rules. Compared with conventional

nmgrams that apply the same rules to the same facts, expert systems differ primarily in sepa-rating the rules and relationships from the inference logic. This difference makes it feasible to use a smaller program to contro the processing, codify the know tly in the rules and change the

rules without changing the proexpert system application that esn't risk corporate survival. System performance optim zation is such an application. If and it works, we're ahead. If it

doesn't, we restore last week's setup. We have wasted effort but not jeopardized the corporate lifebiood. Whatever the out-come, we learn about a technolternative; these, for the most part, are in the mid- and mini ranges. Much of this situati ogy that will soon be with us. Performance professionals have reached the same conclu-sion. Boole & Babbage, Inc. Se-

from 5.7% to 11.3%. IBM Jap

to \$375 million.

achieved this performance while its profits rose from \$142 million

IBM Japon to reach these results

are as imaginative as they are successful. While the company

employs slightly fewer than 20,000 people, it keeps legions

of others involved in promoting

For example, IBM Japan has 119 firms — 17 of sufficient size

nese firms and one based in

IBM Japan'a product lines in

— the PC. PC XT and AT.

made by other vendors are mo

popular than the IBM Japan al-

'Jopon-Izotion' Certain computer

The methods employed by

Vice-President Jack van Kinsbergen feels "expert systems-based performance mea surement products are a natural extension for firms in the perfo mance measurement and man-agement industry." They are valuable because many variables ect performance: these vari infinite ways, and people who un

derstand the implications of the Van Kinsbergen's firm re-cently introduced DASD Advisor to "act as a guru" for IBM MVS sites that lack mass storage opti-mization expertise. "When ex-pert systems-based real-time performance products are avail-

le." he says as he moves on to the next generation of such tools, "they will represent a dra matic improvement for the DP organization as well as the corporation it serves.

Advisory opproach Jim McGuire, vice-pres

ducts and marketing at BGS ystems, Inc. draws a distinction between systems that advise and systems that take over. "It is one thing to use Al to completely answer a problem," That's tough. It's another to se Al to prop

That's do-able." McGure's advisory approach supports the concept of using performance optimization to introduce Al to corporate environment People can learn from such a sys tem by observing its suggestic and how they vary with changing

One need not have an IBM mainframe to benefit from expert performance-analysis systems. Digital Equipment Corp. recently announced VAX Per formance Advisor for system tuning It takes performance facts from other system monitoring software, applies rules gleaned from the knowledge of human experts and produces reports for system managers. With a product announced by one departmental system vendor, can

others he far behind? In most DP shops perfor nce analysis is a second-class citizen. It does not get the attention it should. Many MIS managers spend \$500,000 on new hardware rather than \$50,000 to get the same performance from the hardware they alreads

One reason is the scarcity of expert performance analysts. Here then is a marvelous onportunity. To learn about a new technology painlessly and at low risk and to do a better job of man aging resources at the sam



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SOFTWARE & SERVICES





to sell AI About three years ago, the arti-ficial intelligence business start-ed, with a euphoric belief that

potential customers would fall on their knees — and un tie their purse-strings — as they saw Al gurus coming down from their ivory towers and inging the truth to plain and If you think that this is an ex-

ggeration, just read Tekr dge, Inc.'s commercials of that time. Unfortunately, it did not happen. Plain people did not re the Al gurus optic And they did not buy. They turned out to be very, very

One of the major reasons for such a cool reception is an educational gap. Hardware sales ents are good at talking about ngs like tagged architecture. hardware-based garbage collec-

tion and flavors. talk about forward vs. backward chaining, rule-based vs. framebased technology and how hy-

IFPS/Plus revision debuts

Natural language query, response capabilities among enhancements

BY CHARLES BABCOCK

AUSTIN, Texas - Execucos Systems Corp. has announced that Version 3 of its widely in staffed decision-support system, IFPS/Plus, includes rules-based ramming that provides natural language query and re-

Currently in its 13th rel in as many years, IFPS/Plus is a business modeling and analysis tool able to process "what-if" and "how" queries against a pre-viously contrived financial mod With the addition of rules lower degree of computer litera

Data View

Cullinet Software, Inc.

PERCENT OF GROWTH

lication revenue to grow m 18% in 1966 to 50% of total revenue in 1990

in quarter 3" and receive a re-sponse that says, "Because sales cy than previous IFPS users could then make use of it in region 4 decreased," accordcucom spokesman

chard D. Tuttle The natural language capabil

ity was developed by the Intelli-gent Systems Lab at Carnegie-Mellon University during a fouryear period.

ar person. Although Execucom spokes-en could not define the extent of the system's vocabulary, they acknowledged that both queries and responses would be limited to the business terms and relaonships defined in the model. The model must be constructed by a systems analyst. Middle nagers or executives with a

through the natural language fa-cility, according to Steve Murchie, product manager.
The natural language capabil ity was termed the most signifi-cant of 250 enhancements claimed for Version 3, Murchie

It includes a noise filtering in to screen out voc ulary in a query that does not re-flect the definitions in the business model. The system acta on the ouery at the same time seeking the underlying meaning of a question such as, "Why did sales get all goofy in quarter 3?"

Continued on page 24

Compiler for ICL only

Oracle Corp. is developing a version of its relational data base management system to run on International Computers Ltd.'s (ICL) systems using a C compiler that was made developed by Edinburgh University and Edinburgh Portable Compilers "sole ly for ICL's use," an EPC an EPC

Sotas, Inc. in Haverhill, Mass., has bought acquired the Software International Corp. line of system from Computer Associates International, Inc. Computer Associates acquired Soft-

Vmark Computer, Inc. in Na-tick, Mass., has signed a value-added dealer agreement with IBM to sell Vmark's Pick-to-Unix application conversion software on IBM's RT Personal

ware International in December 1986 and is selling off the lines it

Feds focus of Ada tool

BY MITCH BETTS

SAN JOSE, Calif. - Hooing to increase its penetration in the federal government market, Tolerant Systems, Inc. has announced a software development system for the Ada pro-

gramming language.
The Tolerant Ada Develop ment System (TADS) is hosted on Tolerant's Eternity series of fault-tolerant, Unix-based computer systems, which are typically used for on-line transaction

processing We believe that Ada will open doors to government apply cations" that can use Eternity's architecture, according to Ton

E. Banks, Tolerant's director of The Ada language has been mandated by the Department of

efense for use in mission-criti Tolerant is seeking to do busi Continued on page 27

4GL tests, debugs, compiles CICS applications Cygnet includes its own tele-

BY CHARLES BABCOCK

LOS ANGELES - Phoenix Software Co. is offering a fourthgeneration language that allows a programmer to interactively test and debug a CICS program during development, then com-pile it for running in batch mode. The language, Cygnet, has en available for a year and is installed at 25 sites. Users report that they can develop applications that can run either as ne programs or under IBM's CICS teleprocessing mon-itor. While other fourth-genera-

processing monitor, followed by a recompile, converts the application to CICS, according to lames W. Miles. Phoenix Software president. right time for us. We were plan tion languages can be used to generate CICS applications, most are interpretive rather than compiled, Phoenix Softgage-status tracking firm for ware and industry representa-

rocessing monitor that permits the stand-alone mode - a onestatement change in the app tion denoting CICS as the tel

"Cygnet came out at just the ming on bringing in CICS and an-other fourth-generation lan-guage when we found we could just use Cygnet," said Russell A. Wong, vice-president of data processing at Lenders Real Es-tate Tax Services (Lereta) Corp., a Van Nuys, Calif., mortbring in CICS at a later date. It

der Cygnet."
The DOS version of Cygnet costs \$25,000, and the MVS



version is priced at \$35,000. ing Cygnet saved the 30-COMPUTERWORLD

employee Lereta the expense of installing CICS and the system overhead it would represent on the firm's IBM 4341 processor Development with Cygnet is milar to developing a batch program, except the programto 16 copies of a program and

mer is working in a fourth-gen-eration language with only 18 instructions; hence, he does not need to know CICS com vel code or other CICS reirements. Wong pointed out. Existing CICS applications can be incorporated into a Cvenet application by invoking a Call command. The applications may be written in Cobol, PL/1 or As

mbler, Miles noted During development, the pro-grammer can make use of interactive trace and debug facilities that show the data accessed and iables used. A Cygnet appli-

cation can be debugged, tested, compiled and link edited on-line in a fraction of the time it would take to perform the same func tions in batch mode. Miles noted Cyrnet includes the library of a predecessor Phoenix product, Condor, an on-line development system. The library maintains up

provides an audit trail for program changes. Miles said. In addition, Cygnet contains the full-screen editor from Condor and a data dictionary. Ler ta's Wong said the language allows a developer to produce a batch program 'hvithout leaving the on-line environment. A few days' training in Cygnet is ade quate for a qualified Cobol pro-

Cygnet applications are also 'ouasi-re-entrant... One coor can be used by several people at the same time," saving system resources. Wong added

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On-Line offers Ramis system for PC users

BY ALAN ALPER

FORT LEE, N.J. — On-Line Software International, Inc. has unwelled a version of its newly acquired Ramis fourth-generation language and data base management system for IBM-compatible personal computers that provides micro-to-main-

frame information management.

Called Ramis/PC Workstation, the package features a relational data base manager, a fourth-generation language report writer, a workstation manager and a micro-to-maniframe link.

a micro-to-mainframe link.

Featuring pop-up menus, Ramis/PC
Workstation has an open architecture and
can be used with most PC spreadsheets,
graphics and word processing programs,
according to On-Line Software spokes-

Aimed at departmental end users, Ramis/PC Workstation operates on IBM Personal Computer XT- or AT-compatible systems running IBM PC DOS 2.0 and Microsoft Corp. MS-DOS 2.11 — or later versions — with at least 512K bytes of memory.

Stand-alone or mainframe use Rams/PC Workstation can be used as a

stand-alone information management system or in conjunction with Ramis Information System on a mainframe. From Ramis/PC Workstation, users are able to enter Ramis mainframe appli-

cations with a single keystroke without leaving the workstation environment, according to On-Line Software. The package works under a variety of IBM mainframe environments, including

IBM mainframe environments, including VM/CMS, MVS/TSO, CICS — under both MVS and DOS/VSE — and ICCF under DOS/VSE. In addition, it runs in VTAM/NTO and TCAM On-Line said.

Available immediately, the package lists for \$375, according to Jonathan Smith, product marketing manager.

Targets varied experience levels
Using menus and no syntax, inexperienced users can develop their own applications and create and customize reports.
Experienced users can go back and forth between the mainframe and PC, providing a means of distributing computing activities within a corporatios. Smith

added. Sophisticated users can use the PC for prototyping mainframe applications and creating smaller, stand-alone applications when needed, Smith said. Data can be uploaded and downloaded to and from file and data bases accessible to Ramis Informent of the protocol of the protocol of the said of the protocol of protocol o

mation System.

Ramis was acquired by On-Line Soft-ware from Martin Marietta Data Systems, Inc. last year. Martin Marietta acquired what was then known as Ramis II when it bought the Princeton, N.J., soft-ware firm. Mathematica Products Group.

It is widely used in information centers and competes with Information Builders, loc's Focus.

On-Line offers | DEC, Soft-Switch to tie All-In-1, Profs

BY NINAMARY BUBA MAGINNIS
WERRIMACK, N.H. — Digital Equip-

ment Corp. and Soft-Switch, Inc. recently signed a cooperative marketing agreement to sell Soft-Switch Mathridge servers that transparently link IBM's Professional Office Systems (Profs) networks to DBC's All-lin-1 mail systems.

With Mailbridge servers, users can exchange Profs documents and All-In-1 messages. All-In-1 users do not require any IBM training to operate under Mailbridge, according to the vendor. When

out a network, DEC users can send electronic mail to the server, which automatically routes mail to recipients regardless of the hardware they are us-

The Mailbridge announcement broadeas DEC's All-In-1 connectivity, which already includes an IBM Distributed Office Support System connection. Vaxnotes conferencing, X.400 Open Systems Inter-

conferencing, X.400 Open Systems Interconnect gateway, AT&T's Unix System V Interconnect, Telex Message Router and Wang Laboratones, Inc.'s office systems, D&C said. An installation requires two Mailindges, not on the DEC system and another on the IBM host. For final form interchange, the Mailindge Server/DEC and the complementary Mailindige Server/Profs are both priced as \$18,000. A revisable form support that allows the interchange of fully editable documents between DEC and IBM systems costs.

\$14,000. Mathridge servers are slated to be available from the King of Prussus, Pabased Soft-Switch for immediate delivery. Soft-Switch provides service and support for its software.

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COMPLITERWORLE

Microbasis broadens user interface

BY CHARLES BABCOCK

DUBLIN, Ohio - Information Dimensions, Inc., maker of the Basis mainframe text management system, has added a window-oriented user interface to its microcomputer product, Microbasis.

Microbasis Version 4 is intended for retrieving text distributed on compact disks and is available immediately for use in reading read-only compact disks, the

firm said. Microbasis is dubbed onto each compact disk at a license charge of \$25 per

tomers who wish to distribute text and ation for use on Microsoft Corp. MS-DOS personal computers and the Digital Equipment Corp. Microvax, ac-cording to William G. Griffith, Informa-

tion Dimensions president. Microbasis was first issued two years ago but has been upgraded to incorporate eater ease-of-use features. The winw-oriented interface provides pop-up mus and function keys or a numeric key pad to perform search and retrieval fu tions, explained Steven H. Clark, Infor-

The software package can manage text on a 550M-byte hard disk and requires 512K bytes of random-access quires 512K bytes of random-access memory on a PC. Information Dimen-sions, a subsidiary of Battelle Develop-ment Corp., is developing interfaces to Wang Laboratories, Inc.; a office systems for release in the middle of this year and DEC: A BL to define suscessor for polacea in

DEC's All-In-1 office system for release in September, Clark added.

In addition, Microbasis offers a clipboard function to enable users to extract and tag retrieved data with time and source labels. Users are able to comment on extracted information to be written to MS-DOS files, allowing quicker a of bibliographies, ad hoc reports, product ordering information and other such ma-terials, Information Dimensions officials

Microbasis reportedly offers the same query language as the mainframe product to perform text searches for key words and expressions. Searches may be con-ducted by word prefix, suffix, embedded character strings, single term, multiple

term and word proximity.

Griffith said Information Dimensions believes that systems like its mainframe product, Basis, should be referred to as text information management systems to clude numerical data and, in the future, images as well as text. Griffith said his company will press to get the phrase ac-cepted as the industry's way of referring

to text management systems. Information Dimensions recently signed a cooperative marketing agree ment with DEC.

IFPS/Plus CONTINUED FROM PAGE 19

Other features of Version 3 include the

• User-defined full-screen forms to be used in supplementing applications with custom forms for data entry, prompts and essages

· Personal computer-oriented features in the PC version of IFPS incorporated into the mainframe version's modeling lan-guage. Case management, for example, allows a user to save, maintain and update

what-if" cases and mod- Applications driven by data: bles in the built-in relational data base management system allow users to de-sign multidimensional applications.

 Improved interrogation of multidimensional models. The nonprocedural modelsing language has been extended with new ANALYZE, GOAL SEEK and OUTLINE ANALYZE, GOAL SEEK and O'U LLINE commands. ANALYZE is designed to re-veal relationships behind the results to show the interplay of various factors in the model. GOAL SEEK is designed to find the performance level needed to achieve a targeted result. OUTLINE pro vides a graph of the hierarchy of comp nents that went into a consolidation, Ex

· A DIAGRAM command creates a flow-A DINGKAM common creation with chart depicting which variables went into creating a particular result yielded by the creating a particular result yielded by the system. An AGAIN command allows an-other analysis to be performed after the change in a variable or variables, spokes

Business models may contain up to 8,000 variables and hundreds of nodes or levels in a consolidation. A node is often a geographic territory, product line, unit of activity or an organization chart, Murchie

IFPS has sold 1,600 licenses during ita lifetime at current prices that range from \$9,000 on the low end of the Digital Equipment Corp. VAX line to \$85,000 on BM mainframes running MVS/TSO or VM/CMS operating environments. In addition, Execucom has sold 15,000

microcomputer versions of the product.

Execucion was acquired in 1986 by
Travelers/Diebold Technology Co., a
joint venture of the Travelers Corp. in Hartford, Conn., and the Diebold Group Inc. in New York.

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pand up to hundreds of users. A uniprocessor with the same kind of power would cost you four

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NATURAL 2 (Arrives May 8.)

Use English CONTINUED FROM PAGE 19

brids such as Intellicorp. 'a KEE system, Inference Corp. 's ART or Carnegie Group's Knowledge Craft can do it all. Group's Knowledge Craft can no it air. However, most salespoople generally fail to explain to customers why they need to know all of this. Unfortunately, both end users and salespoople know little about how to take advantage of expertm technology.

system technology.

The problem must be solved by fo-cused training of both vendors and end us-ers. In addition to seminars and training courses, training must involve joint ex-pert-system development. However, many companies follow the path of least istance. They sell tools to educated Al professionals rather than to end users. As a result, they shrink their own mar-

Teknowledge is one of the few com-panies that recognized the danger of the casy way quite early. Teknowledge rted joint ventures with customers showing them how expert-system technelogy can affect customers' bottom lines. As a result of hard work with cus-tomers. Teknowledge had its first prof ners, Tek tomers, Teknowk able year in 1986

Symbolics, Inc. is one of the few com Symbolics, Inc., is one of the few com-panies that has not recognized the dam-gerous situation. At a press conference, in Booten last fall, both Russell Notisker, Symbolics' president, and Bruce Rusch, two-president of smarketing, spent much time selling very large-scale integration. CMGS gate array electhology and bosst-ing of Symbolics' technological superior-ty over an unamed company shentiled by other as Texas Instruments, spec-tral control of the control of the con-trol of

rd work with end users. So far, Symbolics has not been very instrumental in

Symbolics' show could excite some salysts, but plain customers turn out to be smart again. If nothing changes, Sym-bolics will remain an undisputed leader in the research and development market, the research and oevelopment market, but it will hardly improve its position on the vertical commercial market as it is desperately seeking to do. The question is, "How long it is going to take to satu-rate the R&D market?"

The controversy is clear: Horizontal companies develop tools, but end users need end products. The solution is obvious: In order to advance, horizontal com panies must arrange communication with end users in user language, with

Eveing

CONTINUED FROM PAGE 19

s with systems integrators bidding on ness with systems integrators budding on federal defense contracts, Banks said. TADS features a production-quality Ads compiler that has been validated by the Pentagon's Ada Joint Program Office, the vendor said, as well as a debugging fa-

Tolerant derived TADS from the Ver-dix Ada Development System under an agreement with Verdix Corp. in Chantilly,

TADS has a list price of \$20,000. A \$4,000 runtime license, available sepa-rately, entitles users to execute TADS application programs on Eternity syste that do not have the full development s

training a must Joint expert-system development will

ost likely achieve that goal. Ultimately, the solution m ion may be found Ultimately, the solution may be for in a matrix company. By a matrix com ny, I mean the company that acquires expertise in a variety of — and eventual ly, in all available — hardware and soft-ware tools and, based on that expertise,

ly, in all avails develops a variety of applications for vertical markets. Typically, the matrix pany is not a hardware or software for. The matrix company a service must be quite comprehens

A matrix company is not a fruit of my imagination. Such companies appear, but not in the U.S. At the European Confer-ence on AI in Brighton, England, last fall, re were at least two com

promise to become matrix companies. AI Ltd. started as a reseller and sup-porter of Xerox Corp. 1100 LISP maes and software running on them,

but now the firm also supports software tools running on IBM Personal Comput-ers. In the near future, this company in-tends to support Intel Corp.'s Intel Peral Super Computer. It will also develop aonal Super Computer. It will also develop applications on any of these machines. Variilla Flavor Co., founded in April 1986, resells and supports Symbolics 3600, LMI Lambda and TI Explorer sys-tems. It will eventually support most soft-ware tools on these machines. It will also

pport two application systems, Brattle esearch Corp. 'a Knowledge-Based Text Interpretation System and Reasing Systems' Refine.

In the U.S., Teknowledge and Carne gie Group, Inc. are close to matrix compa-nies, but with one big reservation: Both are tool vendors and apply their own tools to build expert systems. Sometimes this is fine, but not always: Their tools may be undant or inadequate or just not cost ective for an application in question.

I would not be surprised if some big inventional software companies eventu ally became matrix companies delivering vertical Al products. After all, these comnies delivering panies are experienced in giving end users what they need.

Firthman is the principal consultant in Henry Fird-man & Associates, Inc. in Lexington, Mass., and sothor of the newsletter "Al Through the Looking



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AT LAST...FINANCIAL MANAGERS AND DP MANAGERS AGREE ON SOMETHING: WALKER FINANCIAL SYSTEMS

COMPUTERWORLD

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compating is change. Therefore, the

architecture that is so flexible, mance demands from the use the same huge range commands. Throughout can be cost-

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NEW Systems software

Data Retrieval Corp. has ported its TextDBMS function-text search system Enhancements include an interface to to the Digital Equipment Corp. VAX com-

P 0 D

puter TextDBMS is said to provide the ability to enter, store, edit, format, search, retneve, process, update and publish text It works with three integrated modules: Textsearcher, Textbuilder and Textcom-

poser A base software system on the VAX 8200 starts at \$30,000 for TextDBMS, \$27,000 for Textsearcher, \$27,000 for

Textbuilder and \$24,000 for Textcom-Data Retrieval, 8989 North Decryood

Drive, Milwaukee, Wis. 53223. Tandem Computers, Inc. has an-nounced Netbatch and Netbatch Plus

batch processing software for Tandem Nonstop systems. Netbatch is a scheduler that provides the ability to automate batch job execu-Tandem system or across a net-

work of Tandem systems. Batch jobs can be scheduled according to job priority. system load and network configuration. It also keeps a log of batch activity. Netbatch Plus bundles Netbatch software with DB Batch FE, a batch front-end

product from MIS Information Systems, Inc. It adds a full-screen user interface to the functions of Nethotch Nethatch costs \$1,350 to \$2,700 (or the initial license with a monthly fee of \$100 or \$200. Netbatch Plus costs from

\$1,850 to \$3,700 with a monthly fee of \$170 or \$340 10333

Tandem Computers, 19333 Parkway, Cupertino, Calif. 95014

Applications packages ems Effective Inc. has introduced Meap, computer-

aided engineering software said to predict the typical time required to repair elecnical systems, as-

Meap, which stands for Maintainability Effectiveness Analysis Program, is also said to predict typical downtime associat-ed with each system failure. Mean provides data necessary to compute the cost of ownership, product warranty costs and where-to-repair plans. It provides trade-

off and "what-if" analysis capabilities Meap runs on Digital Equipment Corp. VAX and Microvax II processors using the VMS or MicroVMS operating systems. Prices start at \$8,000. Systems Effective

Vernon St., Norwood, Mass. 02062. Series/

. SNA . LUA ? . CM

u c Bradford Information Systems has enhanced its Interactive Distribution Planning Systems (IDPS)

Oracle Corp.'s SQL-based relational data base management system, an additional 1.500 city and town locations in the IDPS data base, time windows for delivery time constraints, modules for distribution and sis and the capability to run on the IBM RT Personal Computer.

IDPS is a distribution and transportation application. It provides software for optimization, analysis, data base managent and report generation.

Woodview Ave., Austin, Texas 78756.

GSC Computer Services, Inc. has an nounced its Retail Inventory Manageent System (RIMS) designed for the multistore, inventory-intensive retailer

The system is said to provide an integrated approach to stock control in central and satellite locations. According to the vendor, RIMS offers management control of functions such as automatic stock replacement, purchasing, was use procedures and billing.

RIMS is priced from \$35,000 to \$50,000 GSC Con nputer Services, S. Ma

Common, 87D S. Main St., Newtown, Conn. 06470.

Bradford Information Systems, 5608 Packagedeal, Inc. has announced its Accounts Receivable System for the IBM System/38.

Accounts Receivable System features include multicompany and multilevel reporting, customer balances for future, current and four aging periods; detail and summary analysis reporting, audit reports for all transaction types; calcula-tions for credit limits and average days to

pay; on-line inquiry and reporting of customer balance status and statement histo ry; multiple selection screens for custo reporting of data; the ability to select customer information based on 19 different fields; and uncollectable account analysis.

The system is priced at \$3,450 Packagedeal, 6366 Guilford Ave., Indi-



SOFTWARE & SERVICES

Lawson Associates, Inc. has an-nounced Release 4.0 of its Pinstripe payroll package for IBM mainframes. Release 4.0 includes the ability to al-

low noncash benefits, such as con automobiles, to be taxed according to the 1987 Internal Revenue Service tax regulation; the ability to divide an employee's paycheck and deposit it into as many as nine back accounts; to access an individ-ual's paid-to-date and other inquiry records; and to create information for manual checks to be written when necessary.

Release 4.0 of Pinstripe costs \$44,000 on DOS systems, \$49,000 on OS/MVS systems, \$120,000 on SQL/DS systems

and \$130,000 on DB2 systems. Lawson Associates, 2021 E. H. Are., Minneapolis, Minn. 55413.

Aspen Technology, Inc. has unveiled from \$60,000 to \$100,000 Aspen Plus Release 7.1, an enhanced Aspen Technology, 25

software program. Release 7.1 features an optimizati

package, a physical property equation-of-state and an interface to the physical property data bank compiled by the American Institute of Chemical Engi

Other canabilities include di and other unit operations, physical prop-erties and electrolytes and flow sheet con-

vergence and costing. Aspen Plus simulates the performance of any plant with a continuous flow of ma

terials and energy through a network of Annual single-site license fees range Aspen Technology, 25 Cambridge, Mass. 02139. 251 Vassar St.,

Utilities

merical Algorithms G d Algorithms Group, In need that its NAG Fortra Workstation Library offers 172 selected mathematics and statistics routines for mentation on marketations and per-

The 172 routines, taken from the 688 utines in the main NAG Fortran Library include zeros of polynomials, roots of transcendental equations, quadrature, matrix operations, random number eenerators and mathematical constants Each routine includes an example program, the source, data and results to illus trate the routine's usage.

License fees for the NAG Fortran Workstation Library range from \$1,296 for a single workstation to \$384 each for 11 or more.

Numerical Algorithms Group, Suite 100, 1101 31st St., Downers Grove, Ill. 60515

Data Base Architects, Inc. has an-counced Online Help, an on-line environment for creating and publishing docu mentation and instructions in Cullinet Software, Inc.'s IDMS-DC and ADS/On-

Online Help is said to enable users to undate and refine system instructions and examples during development. According to the vendor, it delivers field level infor mation at the terminal without loss of the transaction in process.

Online Help is licensed at \$15,000 with an annual renewal fee of 15%. Data Base Architects, Suite 1700, 2101 Webster St., Oakland, Calif. 94612.

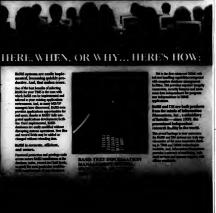
Computer Application Services, Inc. has announced Side-CICS, a program-mer productivity tool for the CICS envi-

Side-CICS features a pop-up menu of fering screen print with formatting option, uppercase and lowercase switch, cal culator calendar time zones area code look-up and quick-message pad as well as access to CICS utilities such as CEDF. CICS' debugging facility, according to the

Other features of the product are said to include the ability to activate CEDF without leaving the transaction and without another terminal, and the ability to print a copy of the screen with borders and advance the paper to the top of the

Side-CICS costs \$100 per terminal with a minimum purchase of two termi-







and mer guide 1400-325-3000 est. 175.

HELP/38



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SOFTWARE & SERVICES

Hewlett-Packard Co. has announced Transition/3000, software for converting Cobol applications on Texas Instruments, Inc. 990 Business Systems computers to run on HP 3000 business

The software consists of conversion utilities and runtime utilities to maintain the TI environment on an HP 3000. According to the vendor, once converted, the same Cobol code is compatible across the agric ALP 2000 lies.

the same Cobol code is compatible across the entire HP 3000 line. Transition/3000 is priced at \$15,000. Hewlett-Packard, 1820 Ebarcadero Road, Palo Alto, Calif. 94304.

Origin, Inc. has introduced Magic Menu, a software program said to allow users to switch between programs on the

Digital Equipment Corp. VAX and Micro-

vax computers.

Running under VMS, Magic Menu is said to let a user jump from any point in a sprogram to any point in a nother program and back. Magic Mesu stores the screen and the terminal attributes for each program. Returning to a program automatically refreshes the screen and restores.

the terminal attributes regardless of whether the program has the capability of doing so. There can be up to nine programs on the menu. Magic Menu costs \$100 per user CPU.

Origin, 9136 Gibson St., Los Angeles, Calif. 90034.

Computer Associates International, Inc. has announced CA-Planlinks, soft-

ware said to link the Tellaplan project management software for mainframes and minicomputers to Superproject Plus.

and minicomputers to Superproject Plus, the resource and project management software for IBM and compatible microcomputers. CA-Planlinks resides on the microcom-

puter and uploads start-dates, task iengths, dependencies and project cost data from Superproject Plus to Tellsplan, the vendor said.

Tellsplan can then create Gantt charts and Pert/CPM diagrams in activity-on-arrow and activity-in-node formats, as well as cost charts, including pic, bur and line as cost charts, including pic, bur and line

charts.
CA-Planlinks costs \$99.
Computer Associates, 711 Stewart
Ave., Garden City, N.Y. 11530.

Development tools

Masscomp has announced its Laboratory Workbench software for use on its line of MC5000 micro-supercomputers. Laboratory Workbench is a user inter-

Laboratory Workbench is a user interface said to simplify real-time data acquisition tasks. According to the vendor, the interface eliminates the need for programming in most applications but can still accept Fortran expressions when needed. Users design, test, modify and run experiments using a mouse-and-meau

Features include a time-base menu; ASCII and binary data files with file names and beaders; a bard-copy menu to print out displays and diagrams; and a real-time oscilloscope, histogram, digital and X-Y plot display of data. Laboratory Workbench is priced from

\$3,000 to \$4,900. Masscomp, One Technology Park, Westford, Mass. 01886.

Westford, Mass. 01886.

Computer Associates Internationa

Inc. has amounced CA-Programmer

Workcenter, integrated software for

application development. The software and an IBM Personal The software and an IBM Personal Computer AT workstation. Management software covers application development estimating, project planning, project plann

cities.

CA-Programmers' Workcenter costs
\$90,000 for the DOS/VSE versions and
\$150,000 for the OS/MVS version.

Computer Associates, 711 Stewart
Ave., Garden City, N.Y. 11530.

Watcom Products, Inc. has announced WProlog, an interactive interpreter for the Prolog programming languages. WProlog is said to feature a program development environment that allows

wrroug is said to leature a program development environment that allows program prototyping and the structured modular development of large systems. Programs are developed through the use of simple systax and error checking and diagnostics, the vendor said.

diagnostics, the vendor said.
WProlog is available for IBM 370
mainframes running IBM's VM/SP CMS
for a yearly fee of \$1,800.
Watcom Products, 415 Philip St., Waterloo, Oat., Canada, NZL 3XZ.

Mystech Associates, Inc. has an nounced its Aurora line of artificial intel

ligence products.

Aurora is a generic inference engine
designed for the development of knowledge-based programs. It incorporates the
use of advanced menus, multiwindowing,
a standard three-button mouse and animated graphics. It also incorporates the
concurrent use of both forward and backward chaining techniques and a plain. English language rule-buse. Other features
include on-line data retrieval facilities.

include on-line data retrieval facilities.

Aurora I was designed in Interliap-D
for the Kerox Corp, 1100 system, It costs
\$3,500, Aurora II, written in Common
LISP for the IBM Personal Computer,
costs from \$1,500 to \$2,000, Aurora III,
programmed in C for use on the IBM PC,
costs from \$2,000 to \$2,500.

Mystech, P.O. Box 220, Mystic, Conn 06355



For example: command macros, help features, network management and mult sessions on each port.

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MICROCOMPUTING

SMALL

William Zachmann A well-drawn graphics kit

The Kinetic Graphics System compatible personal computers. The product, from Kinetic Pre-

as software to tra sentation images to one of Ki-netic's Supercenters, where it can be made into color or black and white overheads, as well as

rd copy or 35mm slides. Devices to provide high-ality, high-resolution slide a ransparency output are relarively expensive, some costing much more than \$10,000. Wi ue service bureau approach, Kinetic Presentations makes it possible for users with small or occasional needs for entation materials to devel

expensive output devices. The Kinetic Graphics Sysm consists of four modules: rstem. Words, Graphs and Layout. The base system is re-quired and includes the commu Graphs are used to prepare tex-tual and graphics presentation material, respectively. Layout provides facilities for flexibly ing text and graphics.

Intel simplifies PC board use

Add-ons for AT. XT 286 feature switchless, jumperless installation ry to take advantage of it, he ex-

BY DAVID BRIGHT

HILLSBORO, Ore. - In an attempt to appeal to a broad audi-ence, Intel Corp.'s Personal Computer Enhancement Operation introduced last week two add-on memory boards io: the IBM Personal Computer AT and XT 286 featuring switchless and

ory reconfiguration.

Above Board product manager Steve Saltzman said the boards were announced in reboards were announced in re-sponse to customers who claimed it was "a pain" to open up a system and change the DIP switches when reconfiguring the memory. This will be of particu-lar benefit when Microsoft Corp. or IBM bring out a protected-mode version of PC-DOS and

BY DOUGLAS BARNEY

HOUSTON - Mail order firm

PC Discount, Inc. recently intro-duced the first known Intel Corp. 80386-based portable comput-

For an early user of the firm's Noble 386 Portable, the speed is the most appealing quality. "Speed is sexy," the user said.

Another advantage is the ice. The system sells for

price. The system sells for \$3,000 with a 20M-byte hard

ing for an inexpensive way to of-fer a 386 machine, came up with

drive and 512K bytes of rande access memory. "We were look

The boards are aimed at both inexperienced and experienced users. According to Intel officials, the two boards' software installation program virtually eliminates the need to read the vance the case of use for the per-son who should read the manual but doesn't," stated Anita Locy

product marketing Compared with Intel's previ-ous add-on boards for AT-class es, the new Above Board 286 and Above Board PS/286 boards run on faster machines and cost \$50 more. Each board's maximum 2M bytes of memory can be used as expanded or extended memory in machines with clock rates up

Lavender, vice-president of en-gineering for PC Discount.

80386 portable arrives by mail

The boards can also increase convential memory from 512K to 640K bytes.

According to Intel, the boards' memory configurations can be quickly changed at any time with the software-installa-tion program. For example, memory allocated for expanded ry can be completely or partially reconfigured as extend-ed memory to take advantage of protected-mode applications when they become available.

Help facility Intel said a custom electrically erasable programmable read-only memory (EEPROM) chip enables the switchless and jum perless installation. The EE perless installation. The na-PROM also saves board space. which allows more memory to fit into the XT 286's smaller form

the product as a multiuser oper-ating system and is working with the Software Link, Inc. in Atlan-

support they could trust

micros, we would get hardware

and have to go out looking for software," says Art Niemaszyk,

senior systems programmer. Af ter examining four or five mini

computer products, including IBM's 9370, MIS decided on the

Continued on base 35

IBM's terrible teens

BY SEYMOUR MERRIN

Much of the talk surrounds IBM's new generation of Per-sonal Computers, expected within the next couple of weeks, centers around IBM's building "proprietariness" into these systems — in effect, making The software also includes a them different from the existi base of IBM-compatible perso al computers that still dom

the business marketplace. The new products are expect ed to have features that make them difficult, if not impossible to copy, so the story goes. By do-ing this, IBM will create a system that flies in the face of his toric successes in this relatively young industry and will make things more difficult for its most

Why would IBM do such a thing? Because the PC is like a teenager and IBM like the typi-cal parent. IBM's main selling arm first ignored PCs, even the firm's own PCs, calling them toys. But end users found

Continued on page 3.



Firm chooses centralized PC control to squash remote processing bugs

BY DONNA RAIMONDE

ELGIN, III. - The MIS department of a \$255 million Midwest firm discovered that bigger is not always better when it comes to solving multisite remote distribution and inventory tracking

In a project that took just one year from planning to installa-tion and testing, Safety-Kleen ty-Kleen, a 17-year-old

Safety-Kleen, a 17-year-old company that has increased its earnings by more than 20% for 16 years in a row, keeps a close eye on expenses. "We are a high profitable company, so look at the financial implications of everything we do," project manager Charles Janusen says. Safety-Kleen selfs automobile and washing machine parts and reclaims the chemicals used in

reclaims the chemicals used

to link 35 to 40 of its remote distribution and manufacturing cen-ters to the centralized corporate mainframe, an IBM 4381 Model , 13 with 16M bytes of main memory, cost was a prime con-sideration. In keeping with the company's centralized MIS con-trol philosophy, ease-of-use was P13 with 16M bytes of ma the other critical factor "Wi didn't want to generate any re-mote MIS staff," lanssen says The firm also wanted to deal with established vendors whose

The cost savings from choos COMPUTERWORLD

the idea for the Portable 386 and sales, PC Discount will position found a way to do it," said Gerry the product as a multiuser oper-

200% of what similarly function-Users in the remote sites needed one terminal that could al minicomputers would have access the corporate mainframe for both IBM 3270 CICS-type been Janssen notes. In addition the remote sites do not need opon-line transactions via a Syserators or program tems Network Architecture network by day and receive, unat tended, IBM 3770 batch mod communications by night. "If we went with mims, the vendors could supply us with hardware and software. If we went with

install the new systems themselves. A one-person help center at headquarters can handle any estions that come up. MIS wanted a system with readily available hardware and software and they especially wanted a setup that could grow to service any number of the 250 sales and service operations across the U.S. and Canada. The

department also wanted to give users the capability to do local spreadsheet, word processing and other noncrucial applications Continued on page 38

MARCH 23, 1987

PC kit similar to CAD tools

Graphics tablet, Pagemaker template part of Kurta offering

BY PEGGY WATT

PHOENIX — Kurta Corp. has announced a graphics tablet for IBM Personal Comr and compatible systems, along with a kit to design templates for any applica-

ates with menus of the several ograms most often used. In addition, Kurta'a new line of tablets The Kurta IS input system is reminis-cent of computer-aided design (CAD) tab-lets and digitizers, which draw menu choices on a tablet, for the user to activate features a template of commands for Al-dus Corp.'s Pagemaker page-design pro-gram. The template also includes com-mands for Microsoft Corp. Windows, by pointing with a mouse or pen.

Pagemaker.

Kurta designed a Pagemaker template because page layout, like the CAD programs that use tablets, is graphics-orient-Kurta President Clint Magnussen said the Template-Builder feature is aimed at

"We expect an people moved from the use to the pen in CAD that they will do in desktop publishing," Magnussen so in desktop pub concluded.

concluded.

The line of tablets and pointing devices ranges in price from \$295 to \$7,200, depending on the size of the tablet and number of pointers. The tablets range from 8½-by 11-in, to 24-by 60-in, and attach to the PC with an RS-232 cable. The acmarket applications, as well as for in-house developers who will design temcompanying pen, called a pen cursor, a mouselike pointing de

Graphics

CONTINUED FROM PAGE 35

The entire package is priced at \$695, t individual modules can be bought sep stely or in combination with each other. The package is not copy-protected. Use of Kinetic's service bureau facil Use of Kinetic's service bureau tach-ties is not required. The Kinetic System module supports direct output to a wide range of printers and plotters. Also sup-ported are Videoshow, the Matrix Corp. products and Seiko Instruments U.S.A., Inc.'s D.Scan, Low-resolution slide-

makers like Polaroid Corp.'s Palette are The Kinetic Graphics System uses a consistent menu-driven format throughout. Text and graphics images are creat-

ed by completing on-screen forms, and colors may be selected from a 255 Mas-ter Color Table. Six filled-area type fon are available with superscripts, sub-scripts, underlining, double underlining, drop-shadow and accent font.

Have more Dial-In PCs than your System/3X can handle? Dial-in more PCs on the twinax channel, and save money!

resellers who can customize the tablets with their own templates for vertical-



PCs with emulation boards are limited in how many With emulation boards, each PC takes up one comm line while disi-ing in. When you ran out of comm PCs. Period Local Data's Inter-Lyna'''\$251 directly attaches to the survivor's harmal so you can disi-in twings channel so you can dial-in

Dial-in on the twinax channel without a board By not using a board, you don't pay the high cost for comm ports, a comm adapter, or comm overhead on your System/3X. With Thulynam, 2551-PC software running on your PC, you can dial into the twinax and use less expensive asynchro-nous moderns, too. TruLvex is a software product, so it's easy to instal and doesn't take up a valuable PC

File transfer compatibility with PC Support/3X or PSU Trulynx allows you to transfer files to and from the System/3X with PC Support/3X and PSU. You can work with host data in your favorite PC application, like Lotus 1-2-39

Local Data makes dial-in TruLynx gets you into the ystem/3X easily with its auto-dial and auto sign-on capability. Once and auto sign-on capability. Once online, if you are accidentally dis-connected, InterLynx maintains your host session until you dial back. If you happen to walk away without signing off, InterLynx has an optional inactivity disconnect so phone bills don't eat up your budget.

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lata communications expertise ju can't be beat. We even have a 24-nour on-line computerized help de just because your questions may not come during business hours.

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Labeling options
The Kinetic Graphs module supports

The Kinetic Graphs module supports two and three-dimensional bur and line graphs, high-low graphs, histograms, layer graphs and pie charts. These pro-vide flexible labeling options with the name type formats and options as Words, Graphs can also be combined with more extensive text created by Words using the

extensive text created by Words using the Layout module.

The Kinetic Graphics System pro-vides power and flexibility that equals or exceeds other presentation graphics software I have examined. The results are

As is often the case, the power and versatility of the programs makes them a little more complicated to work with than some of the simpler presentation graphics systems. The four-module

structure of the system (with four sepa rate manuals) makes it a bit difficult to rate manuals) makes it a bit difficult to know where to start. The absence of a tu-torial presentation doesn't help, either. While this can make the Kinetic Graphics System daunting to the first-time user, the results are well worth the

time user, the results are well worth the effort; the programa are not difficult to use once you get the hang of them. There are bots of handy features to the programs, including an easy selection of different bullet formats, optional auto-tising of text, multiple palette creation and selection, stroke (in addition to nor-mal filled) founts for picture output and multiple header styles.

The service bureau pricing schedule is fairly complex but generally reason-able. Plastic-mounted 35mm slides and color overheads are priced at \$6 each on 48-hour turnaround or \$9 for normal 24-hour turnaround or \$9 for normal 24-hour service. A premium as-soon-as-pos-sible service at \$18 a slide is also avail-able. Black-and-white overheads are half

at price. The Kinetic Graphics System is a st-rate presentation graphics package The addition of the service bureau as-The addition of the service bureau as-pect shows that innovation is not just a matter of basic product features. By making it possible to transmit image files 24 hours a day, seven day a week and promising prompt return of completed sibles or transposations. Kinatic addies or transparencies, Kinetic adds be and utility to the software.

board slot.

IBM's teens

that their new computers helped them get the information they needed on their own. They did not follow MIS's rules; they simply bought programs and learned

w to use them.

The problem with IBM's off-pring is made worse because the rapid acceptance and growth of the PC did not allow for a preteen period. The product was born a teenager. By 1986, five years after its introduction, PC sales were more than \$6 billion — 12% of IBM's total revenue.

The rapid growth and changes brought on by that kind changes brought on by that kind of growth represent a major problem to a company that typi-cally works on five- and seven-year plans. Planners and strate-gasts decide what new products, upgrades and features will be annced next year and the year er and the year after that.

All this planning assumes a lowledge of where the market will be in five or seven years. This assumption has been rea-sonable with mainframes, has roven somewhat risky with sid-range products and is totally absurd when it comes to person al computers.

The difference is that the ore the end user has to say, the less certain is the planning function. MIS directors and chief in-formation officers plan for their nizations and justify purchases on longer range factors.

Mute glant IBM's customers for PCs are those end users the giant rarely speaks to. Big Blue's market sur-veys touched only the MIS per-sonnel who had radically different perspectives of what the user needed. Even Chairman John Akers recently admitted that IBM had lost touch with its customers.

The more that IBM tries to srce the PC to fit IBM's view of what the end user should have. the more likely it is that the end user will buy non-IBM or find a way to thwart IBM's goals, as they have since the IBM PC's in-troduction. The more IBM finally recognizes that there are mils of users with specific n and desires differing from MIS's and IBM's perception of what they should want, the greater the probability that IBM will once again become the dynamic leader it should be.

This is a new era, a new envi ronment that will require a new culture within IBM. History is culture within IBM. History is clear: Those companies that re-fuse to change with the times lose their dominance, some rath-er rapidly. Just take a look at General Motors Corp.

currently president of Merrin Resuprema loc a Southwest Conn. hased consulting firm.

Federal PC users unite, plan show

BY MITCH BETTS

WASHINGTON, D.C. - Federal microcomputer managers, aware of their high-volume pur-chasing power, have decided to

beginning this September, the sponsors announced last week. The event, called the Capital Microcomputer Users Forum, will be a two-day affair entirely designed by local users groups. "It's the first microcomputer

Jacobson said the trade show reflects the clout of federal agen-cies in the PC marketplace. "Just look at the IRS laptop buy, which set standards in that market "he show by users, for users," said said, referring to the IRS con

tract with Zenith Data Systems for 15,000 Z-171 Isptops (CW, March 3, 1986).

March 3, 1986]. The show, to be held Sept. 9-10 in Washington, D.C., is spon-sored by the Integrated Soft-ware Federal Users Group and the Capital PC User Group, Inc. Jerry Schneider, president of the latter group, said the show will feature a session on data base management software.

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The Change Control Experts.

Firm chooses

CONTINUED FROM PAGE 35 in the future. Finding the right combina

Town of pickages was not early.

"Everybody has a 3270 emulator,"
Niemanyk says, "but you can't say all emulators has seen emulators and the same." Certain poly functions that worked on dumb 3270 termals would not work with some 3270 emulators, he explains. The group eleared not to take alseasems it claims for their products. "We tested all the equipment of the seen and the products are the seen and the products and sometimes a month!" Janson says. The group discovered both hardware and software problems this way.

software problems this way. In order to reach the functionality level

of minicomputers, the staff had to integrate a number of software packages on the personal computers. "We use Network Software Associates, Inc.'s emisletion package, and that takes care of the 3270 and 3770 needs. Along with that, we use [Software Directions, Inc.] PrincQ so we can spool the reports onto hard disk drivers so they will not have to be printed immediately. And then we wrote some mem-type programs in Cobol to make the

menu-type programs in Control make the PC easy to use, "Janussen 1984 PC XT's with 512X bytes of memory, a 20M-byte hard disk drive and 360K byte diskette drives. They bought IBM monitors, adapter boards and Synchronous Data Link Control communications adapters and Alon Electric. Inc. ALPS P200 250

char./sec. printers. The printers were thosen for their ability to produce good the near-letter-quality characters and for their durability, Janssen notes, because they are likely to be used for local word processing as well as the nightly reports from headoustrers.

Changes had to be made to the mainframe as well. In preparation for the remote site link-ups, IBM's Network Control Program and an IBM 3705 communications processor were added. Because the end users are unsophisti-

cated with computers, the staff had to cati write menus that would allow them to switch between interactive use and report reception mode. "They would not understand what a 3270 or a 3770 emular tor was. They would not know whether to to to

do one or the other, but they do understand whether to receive reports or do interactive transactions. Niemasyk says. Communication is via leased and dial-up ines, using Racal-Milgo, in. Comzimode 96 diagnostic moderns for the leased lines and synchronous Universal Data Systems, Inc. 4800 bit/sec. moderns for the dial-up lines.

Users install systems

MIS came up with a pint to allow users to install their own systems. The communications coordinator, who serves as the first line of help for users, also it sergonsible for receiving all hardware, software and decumentations of the community of the to make sure they work and ships them to make sure they work and ships them to the temporal to the community of the designates unique user Mentification numbers for each system and coordinates on the community of the community of the comtraction of the community of the community of the comtraction of the community of the comtraction of the community of the community of the comtraction of the community of t

"He doean't even have to go out and set them up," Janssen says. "We send saywhere from five to nine boxes. The same ropes perturbative boxes first according to our instructions. It has everything they need, and it has worked for 12 sites already and we are working on eight more "The boxes contain, as addition to the contraction of the contraction to use the system.

MIS was not sife elsewhere while the PC program was developed. "We wrote and coded and tested about 110 CICS programs for the mainframe and had to modity and/or write about 100 batch programs for the mainframe all in the same 10 months that we were doing this project." Jussien says. Sometimes, up to 12 of the company 3 of MIS continues are not as the company 3 of MIS continues are the company 3 of MIS continues are the proposed of the company and the proposed with the continues to the proposed with the proposed with the pro-calendar was proposed with the pro-calendar was pro-cale

"You can say it was fun because it worked," Niemassyk adds. The project was on time and under budget. "You don't hear about those very often," Janssen

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CONTINUED FROM PAGE 35

factor. The Above Board PS/AT could hold only 1.5M bytes on board. Because of the smaller size, the boards can be used in PCs as well, Saltzman added. In addition, the EEPROM contains im-

In addition, the EEPROM contains important information for technical support. The information, which includes testing data and the board's serial number, can be

displayed on the system's monitor.

The boards come with several soft-ware utilities, including some for creating random-access memory (RAM) disks for feat data access and a print buffer.

isst data access, and a print buffer.
Prices start at \$695 for an Above
Board 286 with 512K bytes of memory.
The 2M-byte version is priced at \$1,145.
Two piggyback boards are also available:
s 512K-byte board is \$495, and a 2Mbyte board is \$995.

The Above Board PS/286 adds one serial and one parallel port to the Above Board 286. A 512K-byte model is \$745; with 2M bytes of RAM, the price is \$1,195. A second serial port is available as \$50 user-installed cotion.

N E W 0 D U C

Systems

Kaypro Corp. has reduced the price of its Kaypro 2861 IBM Personal Comput-

Both Models A and C feature a 10-Both Models A and C feature a 10-MHz clock and 640K bytes of random-ac-cess memory. The Model A features a sin-gle disk drive unit with storage capacity of 1.2M bytes per floopy disk. The Model C features the same floopy disk drive and a 30M-byte hard drive.

30M-byte hard drive. The Kaypro 286i Model A is priced at \$1,995. The Model C is priced at \$2,995. Kaypro, P.O. Box N, Del Mar, Calif.

Digital Vision, Inc. has announced the Computereyes video-acquisition sys-tem for IBM Personal Computers and nostibles.

Computereyes is said to allow users to capture real-world images from any stan-dard video source. The slow-scan device connects between any standard video

source and the computer. Capture rou-tines provided include high contrast, true gray-scale, dithered gray-scale and falsecolor images Acquired images are said to be com-

ible with graphics packages, printing utili-ties, terminal programs and picture data

Computereyes requires the IBM En-hanced Graphics Adapter and Color Graphics Adapter, It costs \$249.95. Digital Vision, 66 Eastern Ave., Ded-

Auricom, Inc. has introduced 'N-Touch, software for the IBM Personal Computer and PC AT said to allow Ash-ton-Tate's Dbase III, Nantucket, Inc.'s Clipper and Rose users to link data files th digitized photos and graphics. Users can search photo data bases via

Users can search photo data bases vis a touch screen at an average retrieval speed of 4½ sec. Photos are displayed in high resolution with data and graphics displayed concurrently in IBM Color Graphics Adapter or Enhanced Graphics Adapter or mode. Large data bases can be stored on write-once optical disks.

The entire touch screen-based devel-opment system with an Auricom XT, vid-eo digitizing and display card, 'N-Touch software and 20M-byte disk drive costs \$2,495.

Auricom, Suite J, 17985 Skypark Cir-cle, Irvine, Calif. 92714.

Software applications packages

Cricket Software has announced Cricket Graph, a graphics software package for the Microsoft Corp. Windows

Cricket Graph is said to generate graphs, including regular and stacked hor-iontal and vertical bar graphs and area, line, scatter, pie, polar and quality-control phs. Users can transpose rows and col-ss within the data window, use row numbers as a variable, set minor tick-mark intervals and use decimal notation

Data can be sorted, grouped by ranges 6f values, smoothed and transformed by trigos

Cricket Graph for the Windows envi-

MARCH 23, 1987

ronment costs \$295. Cricket Software, Suite 206, 3508 Market St., Philadelphia. Pa. 19104

Software has unveiled indwrite, s word processor for the Ap-Computer, Inc. Macintosh. Mindwrite features multiple windows and an accumulating clipboard, a hand tool that allows the mouse to be used to move text elements around in a document and the ability to simultaneously select and

ential customers. It operates as a ter t on text, pictures and headings in an unlimited number of different sections of Other features include integrated outized analysis for each household. It can

g tools such as a word-count command, vertical revision bars and search; and replace commands with seven search

Mindwrite is priced at \$125. Mindwork Software, F 222280, Carmel, Calif. 93922. P.O.

rgy, Inc. has anno at, its residential energy-bill analysis

Breakout runs on the IBM Perso Computer or compatibles. It was designed to help utilities itemaze bills for res-

late to Lotus Development Corp.'s 1-2-Breakout is said to conduct a customalso provide energy-saving reco tions and estimates of potential savings if mers convert to

Breakout costs \$995. Xenergy, 60 Mall Road, Burlingt Mass. 01803.

Zeoft Corp. has introduced Publis ers' Paintbrush, a freehand paint soft-ware package for the IBM Personal Com-

Features include the ability to edit im ages 8-in. by 10-in. and larger; the ability to edit in zoom mode; and three font technologies for enh tions and annotation.

In addition, the software support merous text per page-composition soft-Continued on page 42



uctiv



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Lotus PROMPT, a new comprehensive user support program. The 1-2-3 system. The business software investment that increases in value over time.

Lotus 12-3

Business software integrating spreadsheet, graphics and database.



Continued from page 39 ware such as Ventura Software Inc.'s Publisher and Aldus Corp.'s Pagemaker, graphics boards and I/O peripheral de-

Publisher's Parathrush costs ZSoft. Suite A-495, 1950 pectrum Circle, , Marietta, Ga.

Airs, Inc. has announced Marcon, a text-based management system for archiving, filing and

desktop publishing. Marcon features variable length fields, multiple data base searching. on-line editing. browsing and windowing. It was developed for use with hard disks, compact disk/read-only

memory and write-once, readmany-times disks. The product requires 640K bytes of random-access memory on an IBM Personal Computer AT with Microsoft Corp. MS-

DOS 2.0 or higher.
According to the vendor,
Marcon enables the maintenance of large document collec-tions while controlling inven-

Marcon is priced at \$1,495. A network version costs \$2,500 plus \$50 per node. Airs, 335 Paint Branch Drive, College Park, Md. 20742.

Target Software, Inc. has mced Scoop, desktop pub lishing software for the Apple Computer, Inc. Macintosh. Scoon is said to include a fullfeatured graphics package, a what you see is what you get

text editor and page layout and composition capabilities. Features include text wrapping around graphics, filling irregu-larly shaped objects with text. compatibility with various image scanners, automatic and manual

of margins, fractional font sizes, built-in Apple Maclightning spell checker, editing of multiple pages simultaneously and com bility with Apple's Image-

writer and Laserwriter. Scoop costs \$495. Target Software, 14206 S.W. 136 St., Miami, Fla. 33186.

nced Marketing Edge, a personal computer software tool containing 17 applications and tutorials for use with Lotus Deoment Corp.'s 1-2-3. The software was designed t vide a step-by-step approach

market planning. Topics covered include analyzing market potential, evaluat-ing competitors, choosing districhannels, niannine product introduction and setting

product pricing Features include instruction

and Help screens and graphs constructed automatically from the user's data mout. Marketing Edge costs \$149 Successware, Cary, N.C. 27511

Information Sourcemate Systems, Inc. has announced a price increase on its General Ledger, Payroll and Fund Accounting modules, which is part

ntmate integrated Ashton-Tate Dhase-compatible accounting software. The single-user versions of the programs are now priced at

cost \$695. Sourcemate Information Systems, 20 Sunnyside Ave., Mill Valley, Calif. 94941.

The personal computer-based Present Slide Presentati System has been unveiled by SML Services, Inc. The system is said to enable users to prepare, edit and arrange screen images while utiliz-

ing the micro as a full-featured slide projector to display the screen images on a color moni-The system is composed of four programs. The memory-

in percentage and bar-graph Tempo PC Monitor cons of one printed-circuit board and one floppy disk drive. It costs resident Camera captures text

Software utilities

Allied Electronic Service

are accessed terminal emulation

user to create or touch up cap

Allied Electronic Services, P.O. Box 819, Lebanon, N.H. or graphics screeo images, and Pretext, a text editor, allows the 63766

tured text screens. Prepare al-lows users to view the slides and estems. Inc. has organize them into the desired introduced HQ, memory-resi order, and Present displays the dent productivity software de igned for use on IBM Personal Features include a choice of Computers

HO is said to provide disk 16 background colors and 16 dissolve types for transition from slide to slide. management, keyboard macros, desk accessories and other utili-Present costs \$80. SML Services, 6095 River ties. It is memory resident and can be called up over other appli-Chase Circle, Atlanta, Ga. cations. HQ is composed of eight modules including an appoint-ment book, a calculator, security functions, a cote pad, an organiaer and a phone book.

Other features include th names Electronic Services, Inc. has announced Tempo PC Monitor, designed to identify personal computer use. Tempo PC Monitor displays such statis-tics as how many beautiful. ability to transfer data from HQ or an applications program to another HQ module or applications tics as bow many keystrokes are used per hour, which programs are executed and which disk files

program.
HQ costs \$79.
TEK Microsystems, 2067 Massachusetts Ave., bridge, Mass. 02140.

Software enhancements time and total percentage. All data is displayed on the screen and can be printed or saved in a disk file. Statistics are displayed

Gamma Productions, Inc. has amounced Multilingual Scholar Version 3.0. Multilingual Scholar is a fulfeatured, multilanguage word processing program for IBM Personal Computers and compa-

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guages can be written in one file.

Version 3.0 includes support
of contextual analysis in Arabic and full support for 24-nin printers, laser printers and quad-density printing on Epson America.

Inc. printers and compatibles.

Multilingual Scholar 3.0 costs \$350 Laser-printer support costs \$150

Gamma Productions, Suite 609, 710 Wilshire Blvd., Santa Monica, Calif. 90401.

Mathsoft, Inc. has announced Mathcad Version 1.1, an enhanced version of its engineering

Mathcad is said to allow personal computers to perform complex numerical analysis and to document the results. Version 1.1 offers enhanced computational features, including differentiation, integration, root find-

curve fitting, cubic splines and built-in statistics functions The upgrade is also said to provide plots and tables with greater versatility, expanded formatting and printing capabili-ties and increased display sup-

Mathcad 1.1 costs \$249 Mathsoft, One Kendall Sq. Cambridge, Mass. 02139. Lifeboat Associates, Inc. has announced undated versions of software development tool, lvantage C + +, for the IBM PC-DOS and Microsoft Corp. MS-DOS environments and for

Microsoft's X Advantage C++ is said to include its own AT&T Unix Sys tem V-style preprocessor. The translator and driver system is 120K bytes smaller than the orevious version, enabling the program to run in 512K bytes of

supports both small- and large-McCabe nory models. Advantage C++ for the PC-DOS and MS-DOS environ-

ments costs \$495. For the Xenix ronment, it costs \$695. Lifeboat Associates, 55 S. roadway, Tarrytown, N.Y.

10591 Board-level devices

Western Digital Corp. has an-nounced the D210S ESDI-to-SCSI disk controller, the WD1008-SCS optical-disk controller and the WD7000-ASC PC AT-to-SCSI host

adapter. The three small computer systems interface (SCSI) products were designed to accommo-date the 16- or 32-bit CPU systhe user to program up to 1,024

tems and the 10- to 15-MHz c and optical-disk drives priced at \$545.

The D210S is a 5%-in. form factor Winchester disk control ler said to link the enhanced small device interface (ESDI) to the SCSL The WD1008-SCS is a 5%-in. form-factor optical disk controller that supports up to

four ESDI ontical drives Breed on a 1 000-unit o the D210S costs \$165, the WD1008-SCS costs \$250 and the WD7000-ASC \$220. n Digital, 2445 Way, Irvine, Calif.

eight terminals with operating rates of up to 38K bit/sec. It in-Computer Peripherals, Inc. has announced Graphmaster, an enhancement board for the IBM Personal Computer, PC XT

The single board is s compatible with IBM's Enhanced Graphics Adapter, Color chrome Display Adapter. Graph-master emulates each adapter at both the hardware and basic I/O

systems levels, the vendor said Maximum resolution is 720 350 pixels. Memory capacity of 256K bytes is said to be adeate for all modes and applica tions. A character generator in random-access memory allows

The Graphmaster board is

Computer Peripherals, 2635 Lavery Court, Newbury Park. Calif. 91320. Microway, Inc. has announced

AT8, a serial-controller board, Fastcache-286, a 12-MHz In-tel Corp. 80286 IBM Personal Computer accelerator, and 287Turboplus, an IBM PC ac-celerator board.

AT8 has an on-board 8-MHz 80186 with built-in direct-m ory access said to manage up to

cludes software drivers for Santa Cruz Operations Xenix and Concurrent PC-DOS Fastcache-286 is a half card

Merenwere's accelerator said to use 8K bytes of 55nsec

speed of either 9 or 12 MHz. 287Turboplus generates an adjustable clock signal. It plugs into the PC AT's 80287 socket.

AT8 costs \$1.599. Fastche-286 costs \$449 for the 9 MHz version and \$599 for the 12-MHz version. 287Turbs costs from \$549 for the 10-MHz version to \$629 for the 12-MHz

Microway, P.O. Box 79. Kingston, Mass. 02364.

Auxiliary equipment

Electro Standards Laboratofodel 8380-D PC Keyboard and Monitor Switch.

The switch is said to allow al access to one IBM Personal Computer or compatible from esther of two keyboard and mon tor locations. In application, PC Keyboard-Monstor Station A and PC Keyboard-Monitor Station B are connected to the rear panel of the Model 8380-D switch. The IBM PC or compatible is connected to the common port

on the switch. The Model 8380-D PC Key board and Monitor Switch is priced at \$125.

cache. According to the vendor it features zero-wait state mem-Electro Stand P.O. Box 9144, Providence, ory and runs with an 80286 clock R.I. 02940.

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duptex over ordinary diat times.

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formance and reliability, we're not blowing smoke.

McGraw-Hill's Data Communications Brand Preference study cites Codes as offering the best technology, but price performance mote, but service organization, and most informative International Codes Composition, makingheut and network control product categories. 9:1965 Codes Corporation.

NETWORKING



LANs lean on third parties

Despite speculation about a trend toward direct sales, third-party distribution remains extremely important to personal computer network vendors, as well as to their users, for precisely the same reasons —

ing, service and support. The fact is, local-area network (LAN) vendors do not have a great service history, which is the reason that 90% of all articles on networking start off with a "nightmare" theme. This is why resellers specializing in networks are so important to

But LAN support services particularly those provided by third parties — are increasingly in danger of attack from

Network consultants like to say that their clients, typically Fortune 1,000 and Fortune 500 users, care more about performance and functionality than they do about price. Maybe so, but as resellers have found, often the larger the company, the more likely it will take its busi-Continued on page 52

IBM channel link hits market

BY ELISABETH HORWITT

MINNEAPOLIS - An intelligent communications processor introduced recently by Comput-er Network Technology Corp. provides channel-to-channel communications for multiple mainframes, either locally or over remote T1 links, the ven-

dor claimed. **Based on Computer Network** Technology's existing 5100 Channelink products, the Chan-nelink Model 5100/R permits

IBM mainframes to communi-cate at 1.5M bit/sec. T1 speeds. An intelligent system based on the Motorola, Inc. 68000 microprocessor, the 5100/R off-loads

response time from four to 1.7 seconds in one customer configation, the vendor said. Handling T1 channel-to-

channel communications "drags a \$200,000 to \$300,000 IBM front-end processor to its knees so that it cannot handle termina

networking," according to Mac Lewis, Computer Network Technology's president and chief executive officer. In con-trast, the 5100/R utilizes a T1 channel with as high as 95% effi ciency and can interface with a terminal network, he claimed. Transmissions from a main-frame are stored in a buffer so that the channel is free to start sending more data while the first load is being sent over the net-

work, he explained.
The buffer feature also elimi-Continued on page 52

volume on T1 switch

week Link Packetized Voice Server (LPVS) for its Link family of T1 switches, which reportedly will allow customers to increase voice transc volume up to a fac-tor of 10 without having to add T1 capacity. The LPVS offers "near toll-quality voice digitiza-tion," Timeplex said. LPVS uses several voice com-

Server ups

ession techniques to achieve a 10:1 compression rate while

maintaining voice quality that is equal to or better than the Ad-vanced Digital Pulse Code Modulation standard for a 2:1 voice compression rate, according to Joseph Moserino, Timeplex Joseph Moserino, Timeplex Link/2 product manager. Requiring 224K bit/sec. for every 40 voice channels; the system can be configured to take either

all or a portion of a T1 link, "thus permitting a substantial amount of remaining bandwidth to be available for other voice data applications," Timeples

Continued on page 51

UPDATE

Searching for a standard

BY PHILIP J. GILL

hen MIS managers daydream, it's probably about running a shop in which all their incompatible hardware is integrated Distributed file system protocols pror to do just that. Where local- and wide-area network standards provide common proto-cols that define the physical means by which

computers can attach to and communicate with each other on a network, distributed file systems provide a structure for ma-and accessing file systems, shared resand data bases across a network. The only problem with distributed file

systems is that one common standard does not yet exist. Actually, four candidates com-pete for the title of Industry Standard for



s Distributed File System Protocol: Sun Microsystems, Inc.'s Network File System (NFS); AT&T's Remote File System (RFS) with the 5treams communications facility; the International Stan-Continued on page 50

printf("Hello, world\n");

ame C Comp

stitute Inc. announces a ame version of the Lattice® C er—your key to truly portable

your programming investment acro operating environments. Virtually every new computer supports C, and portable programs created with the mainframe compiler under OS or CMS will run on any other machine

other high-level languages, and beer programs, MAIN routines and other high-level languages, and backages such as IBM's ISPF and he invoked directly from

We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time rary produces explicit numbered or messages and a traceback of so e function calls if an error occurs. For all the facts—including details on economical annual licensing com-plete with free technical support and enhancements—call your Software Sales Representative today.

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Real-world ISDN trials pick up steam

BY DONNA RAIMONDI

Integrated Services Digital Network (ISDN) site trals, a mere trickle in 1986, are due to pick up speed this year as vendors seek to test the telecommunications standard under real busi-

ISDN is a network architec ture that defines a common set of protocols for transmitting voice, data, facsimile and video over ordinary telephone lines. Most recently, New Jersey

Bell and Bell Communications Research Corp. (Bellcore) announced that they will jointly conduct an ISDN trial this fall. Additionally, two weeks ago, U.S. West subsidiary Pacific Northwest Bell began a site trial with U.S. National Bank of Oreone in Portland

The six- to nine-month New Jersey Bell-Bellcore site trial will provide ISDN access to Bell-core's Navesink, N.J., Research and Engineering Center. The tri-al will attempt, for the first time, to implement ISDN networking on existing AT&T 1AESS ana-log switches equipped with a small adjunct digital switch — as to using all-digital tches, as in previous trial

While implementing ISDN on a digital add-on switch will not necessarily mean lower service rates, the move is intended to make ISDN more accessible to customers who want only 200 or 300 ISDN lines. This is because it does not necessitate replacing a 40,000- to 60,000-analog Centrex switch with a digital switch, according to Jne Mastriani, di-rector of market and technical planning and support at New Jer-sey Bell.

It is difficult for the diver Bell operating companies to justify replacing an analog switch with a digital switch for a small r of ISDN lines, Mastriani says. Using the small adjunct switch however, "would greatly reduce the investment required to provide ISDN and thereby speed deployment of the ser-vice," says Ray Albers, Bell At-lantic Corp.'s division manager for network planning

Today, digital switches ac-THE IBM S/3

and that number will jump to 50% by 1990, according to Victor Krueger, vice-president of telecommunications industry services at Dataquest, Inc. in San Jose, Calif. Digital switches

functionality by replacing some circuit boards and adding soft-The ISDN Basic Rate Inter face - which will be used in the Bellcore trial - defines two 64K bit/sec. B channels that carry distinged voice, data and video be equipped for ISDN

and one 16K bit/sec. D channel which carries network-related nformation between switching devices, and can also be used for over a B channel with several

packet switching. For example, a Belicore researcher in Navesink could talk

other Bellcore workers in various departments. During the conversation, the participants could simultaneously display in formation such as a memo on their terminals using a D chan-nel. As changes were made, par-ticipants could see the changes on their terminals. The final versions could be stored, printed or seet via farsimile message to

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like MIS DP PC evaluators and information centers. They needed more than boards. They needed a system. So CXI gave it to them. With PCOX Technology A modular

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Belicore, the centralized research and engineering arm of the seven regional Bell holding companies, will ultimately be responsible for implementation of ISDN services in the holding companies' networks.

The New Jersey Bell trial will give Bellcore much-needed firsthand experience with ISDN technology, which will be helpful for planning future services ascording to Wayne Felts, division manager for ISDN implementation support at Belicore. Another field test planned for the near future will test rapid facsimile transfer, automatic messaging, file sharing and

transier, coaxual elimination aiternstives and video teleconferencing at the U.S. National Bank in Portland. to Other planned U.S. West fac

ISDN trials will interface a range of customer-premise equipment with central office switches from NEC America, Inc., Northern Telecom, Inc. and AT&T.

Multivendor drawbock ven
These trials share one drawback, however: In each case, the
voice and data equipment on customer sites is designed to interface with a particular vendor's con

central office ISDN switch.
Still to come are trials that explore communications among

plore communications among different brands of ISDN switches. "Each of the central-switch

"Each of the central switch vendors we are using tries to keep information from the others," says Loren Henry, director of ISDN planning for U.S. West, while speaking at a recent trade

Bankers' encryption gripes end

BY MITCH BETTS CHARLET WASHINGTON, D.C. — The National Security Agency (NSA) and the banking industry have resolved their dispute over use

of the Data Encryption Standard

(DES) for electronic funds transfer, according to testimony at a recent congressional hearing.

sions, the NSA agreed to back off its decision to story supporting DES-based technology for the financial industry, according to Cheryl W. Helsing, who chairs the American Bankers Association's data-security management committee. Helsing is vicepresident and deputy director of corporate security for Bank of American San Francisco.

Under the agreement, the NSA will continue to support the financial industry's use of DES-based technology until an acceptable replacement is available. Helsing said at a recent hearing on the NSA's role in data

able. Helsing said at a recent hearing on the NSA's role in data security. The NSA announced last year that it would replace DES with new algorithms in 1988, apparently on the grounds that DES, which is in the public domain, has become an attractive target of

become an attractive target of code-breakers in foreign countries (CW, May 19). NSA certifies encryption products under its Commercial Communications Security Endorsement Program. "Years of work and many mil-

"Years of work and many millions of dollars devoted to [DESbased] encryption and message authentication efforts were jeopardized," Helsing said.

archized, 'Helsing said.
She added that the NSA action unnecessarily cast a shadow on the security of DES and that NSA restrictions on the use of save algorithms would have made those algorithms should have made those algorithms unuable by the financial industry as a replacement of the things of the said of the things of t

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destinations of APPC and LU 6.2.

works can evolve without making

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Justaboutary dismicro-to-mainframe application program written for CXI, IBM or IRMA" will run on the PCOX system.

the PCOX system.
That includes programs from IBM, SAS, Cullinet, Micro-Rempus, Cincom, Tangram, Sterling Soft-

ware and others.
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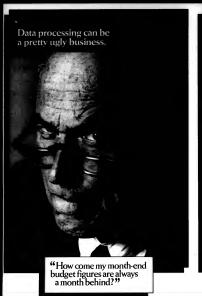
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mainframe g

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And for those users that can't seem to get the work out, it turns ur Courier 9000 Series terminals or other work stations into productivity powerhouses — capable of spreadsheets, word processing, net-working and an unlimited number of customized local functions. All in all, this beauty can make you and your 3270 system look

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The Courier Departmental Proce the true beauty of your 3270 syste

Searching

FROM PAGE 45

dards Organization's Open Sys-tems Interconnect (ISO/OSI) File Transfer, Access and Manment (FTAM) protocol, and Server Message-Based (B) protocol, jointly develd by IBM and Microsoft command syntax

While each of these p offers valuable capabilities, the real potential of distributed file em protocols will not be real

Eventually, shops that use distributed file systems will be able to integrate incompatible dware - some of which may running different operating into a single net work. What is more, a file in this environment, although scat-tered across many machines and perhaps even file system archi tectures, would be maintained. backed up and updated as though it were a single, unfied file on one machine

The protocols will eventually allow one copy of an applicat to reside on one machine and service all users on the network and will change the way the undustry updates and lines

From an MIS viewpoint, dissted file systems will help users conserve precious computer resources and, therefore, money. For instance, network systems administrators could shift files from one system to an as disks reach capacity. They could also choose to place app cations and related files on the machine the local users will most often access them. This lessens network traffic, thereby reduc-

ing network overhead. To understand the strengths nd weaknesses of the protocols as they currently stand, howevthe following descriptions said prove helpful.

endorsements, licensees and entations are the m sures of success, then Sun's NFS is a big winner. NFS has more than 100 licensees, including more than 60 hardware vendors. of which Hewlett-Packard Co. Digital Equipment Corp. and Harris Corp. are a few.

most of the nation's big-name university commuter-science departments, such as Carnegoe Mellon Unive Stanford Mellon University, Stanford University and the University of California at Berkeley According to Bill Keating

Sun'a manager of network soft-ware, NFS is more than a distributed file system protocol: It is a member of a family of network services that permits not only file exchange but also file access and resource sharing across the several networks of disparate computer systems. These other network services include the Remote Execution Environment (REX), the Yellow Pages and the

REX allows users to execut a program on a remote machine while accessing their home directory environment. In other words, users can use the command syntax they are familiar with, such as a Unix or DOS

The Yellow Pages is a dis ated data look-up table that seeps track of all users on the network and records their accessi rights to network re-sources. Lock Manager is NFS's record- and file-locking mechasism which permits multiple us. ers to access the same file with oing each

One of the features that dis tingushes NFS from other dis tributed file system protocols according to Keating, is that it achieves what others only talk about - vendor independ Versions of NFS are available for virtually all forms of the Unix system, including AT&T Unix System V and University of Cali na at Berkeley's Unix 4.2. as well as vendor-proprietary im-plementations. NFS is also available for linking Unix to DOS and

RFS fodes

nsidered a corner of AT&T's thrust into the For tune 1,000, RFS is now ranked



lead last in the four-way distrib uted file protocol race. It is even thought to be behind the less of veloped and less robust FTAM

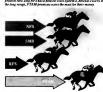
An important part of RFS is Streams, a protocol-indepen dent interface that allows differ The photocol has mon out in ent computers and networks to communicate with each other regardless of what protocol standards they support. Streams s an interface between RFS and networks running certain recognized standards, out-

fined below.

ost a year ago, Streams' initial elease, which is part of Unix stem V, Release 3, will support the AT&T Starlan local ea network In addition, ATAT says it is committed to backing other in-ternational networking stan-

The winner of the race

NFS and SMB are strong contenders in the distributed file system
protocol race, and RFS has a hold on Unix System 5, Release 3 users. But in



There is one substantive difference RFS cannot get arou - it has been designed from the very start to be a Unix-system-

3 tn Unix System V. Release 3

seems that the folks at AT&T do not disagree with

Kesting's assessment of RFS.
"We have said before that RFS is

for a homogeneous Unix envi

ronment and NFS is for a betero

Moreover, there has lone

en speculation that Sun as

AT&T would join forces to mal

the same network. While declin-

ing to comment on any particult

ing NFS and RFS.

vet interface.

east known stan

Ironically, the most wid

mented and installed distrib-

ited file system protocol is prob

networks using Microsoft's MS

systems, communications and

the core protocol for DOS net

ork file operations and ser-

plications software. "SMB is

us Unix environ

AT&T spokesman says.

col suite, the Department of Defense's Transmission Control Protocol/Internet Protocol General Motors Corp.'s Manuring Automation Protocol and Boeing Computer Services Ca's Technical Office Protocol, as well as CCITT's X.25 - the international packet-switching protocol — and, eventually IBM's Systems Network Archi

rds such as the ISO/OSI prote

NFS is almost always pitted ainst RFS as its archrival. The matchup is only natural as both have roots in the Upin com ty, although NFS originated in the Berkeley Unix 4.2 world and comes directly out of AT&T Bell Laboratories and Both RFS and NFS do many

of the same things: They both provide transparent access to network resources, file systems and data bases. And both work with AT&T's Unix System V Release 3. Interestingly, RFS was the first to have record- and file-locking facilities NFS as it was originally constructed, did

But, as Dave Morse, product marketing manager at Hewlett-Packard's Colorado Networking Division in Fort Colline Cole outs out: "It probably didn't need it when it first came out bese of the (technical and scien tificl en ating in

Morse who oversees not work offerings for technical apis, notes that HP supports NFS and SMB and is committed to supporting the emerging FTAM protocol. How ever, it does not, and does not in-As announced by AT&T al-

tend at this time, to back RFS. "RFS is the one most in doub of the four," Morse says, "Ou "Our company is driven by what our customers ask us for." And Morse says, HP's customers are asking for NFS. "Both RFS and NFS do the same th says, "but NFS is ahead in the SMB was jointly developed by IBM and Microsoft. While it provides the same basic services as the other distributed file aystem tocols, most observers agree that SMB's greatest potential is as a medium between DOS and Unix systems residing on the same network — an increasingly niar phenomenon. Although NFS has b

sted to support DOS sysns, Harker says he believes SMR is better suited technoli cally than NFS for the DOS world of commercial applica-tions. For instance, SMB intions. For instance, cludes a record- and file-locking nism, while with NFS this is a separate facility — the Lock Manager. "You have to do some-thing extra," Harker says. AB makes better conversion een DOS and Unix files sys tems, largely because it is exactly the DOS calls."

SMB does have its limitaons, however. For instance, Harker notes. SMB requires the user to know the exact file name including any machine and directory information - in orde to access the file on a remote machine across a network

to-Unix-system protocol. According to Sun's Keating, RFS is Harker also says that SMB "Unix System V. Release suffers from limitations imposed on it by DOS, which is a single-NFS, on the other hand, is tasking operating system. Unix, on the other hand, is multitasking as the premier distributed file system protocol for ening, which creates problems in vironments of mixed Unix aysconstructing a bridge from NFS or RFS into an SMB environtem versions as well as for mixed Unix and non-Unix envi-ronments, including IBM PC-

nce of FTAM Unike the other three contend ers, which have deep roots in and specific ties to a particular oper-ating system, FTAM was, from

its inception, designed to be op 'NFS and RFS are Unix-ori ented. As such, they reflect the Unix way of doing things with files and the way file systems are constructed within Unix." says RFS and NFS work together on Charlie Bass, co-founder of Un germann-Bass, Inc. and chair en of Touch Come agreements between Sun and AT&T. Keating does say that Inc. a developer of networking software. "SMB is DOS-orientone of the ultimate goals at Sun ed and has the same nersons in thinking about a merged 4.2/ System V Unix kernel was link-"be adds. Conversely, FTAM's operat-

ing system independence is a philosophical premise and technical feature embodied in its de-"What you really want is for the location of a file to be able to wander through the net-work," Bass says. "The way [NFS, RFS and SMB] are being ably the least well known, SMB is the standard for DOS and mixed DOS/Microsoft Xenix installed, you have to know the difference between a local and ote file Net interface.
"Anything with MS-Net uses
the SMB protocol," says John
Harker, communications product marketing manager at Santa
Cruz Operation, a Santa Cruz,
Cald., supplier of Xenix-based

Although Bass says he be

ieves that FTAM will be the ng-term industry-stan ated file system protocol, he admits that in its current form it exhibits some shortcomings "At this point, it is very modest in its facilities," Bess says. "As it matures, adding features and becoming more robust, it should be Continued on page 51

Searching

able to sit under the other three and ac-complish true file access. You could run NFS, RFS and SMB as operating system sets of file-access primitives — or verbs as they are sometimes called — on top of FTAM."

Considering all the distributed file sys-tem protocols. Bass predicts, what will be left will be protocols like NFS, RFS and SMB, each running in environments where they are well entrenched and well suited to the needs of the application and user bases. FTAM will then form an invisible bridge, or neutral ground, between systems supporting NFS, RFS and SMB, allowing them to exchange data and share

nsensus on the current status of the

our goes something like this: NFS has easily emerged as the de facto standard for scientific, engineering and other technical computing applications and environments, which is not surprising considering that it was developed by Sun, a leader in the technical workstation mar-ket. RFS solves a limited problem at this point, that of sharing resources between AT&T Unix System V, Release 3 machines. So RFS would have some impor-tance in environments committed to that

standard only SMB is to the commercial microcom-ting world what NFS is to technical computing — a de facto standard. It is heavily entrenched and is likely to contin-

ue to be for quite some time nately, however, all agree th Ommately, however, all agree that FTAM will triumph, even if, as Touch Communications' Bass suggests, it does so as the invisible, neutral protocol that these the other three together and permits them to communicate with each other. "That's where everybody will go," iting says. "It's the future."

Gill is a San Mateo, Calif. based free-lance wrote and former editor in chief of UNIX/World

Server

CONTINUED FROM PAGE 45

The LPVS comes in two mod Priced at \$145,000/pair, the LPVS-40 accommodates up to 40 simultaneous voice conversations over four 56K-bit/ sec. channels, providing a 10.1 compres-sion rate. Priced at \$33,000/pair, the LPVS-8 allows up to eight sim voice transmissions over a single 56K-bit/ sec. channel, providing an 8:1 compres-

Timeplex also announced the Integrat-ed Channel Service Unit (ICSU), the first Timeplex channel service unit (CSU) that uses the Extended Superframe industry standard for communicating diagnostic and error-checking data to a centralized

An ICSU configured with a diagr control unit and four nonredundant CSUs control unit and four nooredundant CSUs will have a list price of \$13,000, or \$3,300 per CSU. The ICSU supports up to 14 dual CSUs in a single enclosure and provides control and diagnostic functions via an Extended Superframe link to Time-plex a Link Network Management Sys-

IBM unites telecom marketing groups

Combines Rolm's operations and own support staff to offer a single point of sales

cations sales. The new sales group combines IBM's U.S. Direct Sales and the service and support operations of subsidiary Rolm Corp. with IBM's Information Systems Group

The marketing organization is respon-

ARMONK, N.Y. — IBM recently formed the Telecommunications Marketing and service of Robin products and technical Service Organization within its Information Systems Group and can now offer its customers a single point of telecommunications products and other IBM telecommunications productomers a single point of telecommunications.

'Increases customer focus'
"This is an important step toward provid-ing a single IBM marketing and service organization to increase our focus on our customers' telecommunications product needs," said Edward E. Lucente, IBM's vice-president and Information Systems

The group's North-Central and South-West marketing divisions and the National Service Division will continue to marand service ns products other than the Rolm product line, according to com-

ny officials. The Information Systems Group's Na-mal Distribution Division markets IBM's telecommunications products other than Rolm's through alternative distri-

The 15-Minute Data/Voice Network

Line Miser Converts Your Ordinary Phone System Into a Local Area Network

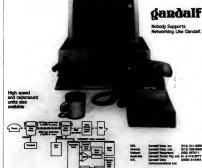
v you can turn your phone sys-into a versatile local area net-ix (LAH) for data and voice. It's easy as plugging in a new tele-me. And it taless about that

separate the data from the voice. Should your PEX fail, the data will not be affected.

Line Misers provide a fast, cost-effective means of expanding your data terminal network — up to 18,000 feet. Everywhere you have a telephone, you can quickly and easily add a terminal. It's a plug-in job — all you need is a power outbet

duplex data rates up to 19.2 is can be handled. Also suppo chronous data at speeds up t

64 Kbps.
What's more, all Line Misers
are FCC registered. Genduif Line Misers let you create your dista-overvoice LAN in record time and at a
price you can afford. Call your local
Gandalf sales representative for de-



LANs lean CONTINUED FROM PAGE 45

ness through the bidding process. This is a little short-sighted. The lowest bid can turn out to be a risky proposition for evervone else involv

It's frustrating for the reseller, who isults with the user, helping to deter-ne office and technical needs, testing apment and mapping out system spec ment and mapping out system spec ons, only to lose the bid and all that nary work to a lower offer

No wonder one former network re-iller doesn't paint a pretty picture of his revious occupation. "It [networking] is od market for good [full-service, sort] people," he says.

From a user's perspective, some-times things work out just fine. But other times, the best offers come from resellers who aren't authorized to sell the sys-tems — hardly a minor point. Other times, the bid is so low that there is no margin for support. The user gets his CheapLAN but ends up eating expensi-service and training functions. Remem ber that frustrated reseller? He often

comes back and cleans up the mess urtesy of a stiff support contract. A former West Coast network resel er, strong on service and support, closes his doors last fall after losing one too many contracts to poorly qualified low history Bill Alderson laments the plig of knowledgeable network resellers. They're caught between a rock and a

hard place: end users who only care abor price and vendors who only care about volume. He closed his reseller business, Xmital, after "losing \$500,000 telling o Heart no

and abused us," he says.

Networks have become such a com-modity that quality dealers are going out of business because they cannot compete with dealers that sell below list price

As for the vendor, well, it faces bad word-of-mouth at minimum. The proble with independent LAN vendors is that many simply cannot afford to provide ser vice and support directly to the user. In about the training and support they re-ceive from these wendors.

The point is, despite all this talk about the strategic importance of connectivity and backbone networks, many corpoand backbone networks, many corpo-rate buyers are showing dangerous signs of buying networks as if they were com-modity products. Buyers with that atti-tude had better think twice. For peace of mind, it just might pay to take some free advice from Alderson.

You can't have both, users. If you nt good service, you've got to pay for it," he says. Networks are so hot that hundreds of people with minimal qualifi-tions are hanging out their shingles as network specialists. "Unfortunately, ost users wake up to the fact that dis unters don't provide service only aft ey find themselves stuck with thou-nds of dollars in equipment that doesn't ark," Alderson adds.

Now that is a nightmare situation.

Keefe is a Computerworld senior editor, network

IBM link CONTINUED FROM PAGE 45

nates the need to synchronize timing b tween communicating mainframe chan-nels. Lewis claimed. This increases maximum distance between two hosts or between a host and a peripheral, since a nchronized link can go out of commis on if it takes too long for an acknowleds

ent to arri Buffering also gives the 5100/R great-er flexibility in allocation of T1 bandwidth, acording to Lewis. For example, a communications manager can allocate part of the 1.5M bit/sec. capacity for voice communications during the day, but reserve the whole T1 band for data center modeling communications.

pdating overnight.
Where the original 5100 was a point-o-point channel link, the 5100/R can ham-

one channes-to-channes communications for up to 10 hosts using IBM's IMS/ Multiple Systems Coupling feature, so that terminals attached to one host can access data on other hosts by high-speed local or remote links, Lewis said. By acting as an interface between multiple hosts and terminals, the 5100/R can eliminate the need to designate a different Systems Network Architecture subarea address for each mainframe, he added.

Multiple 5100/R's linked together through a broadband local-area network

can support up to 65,000 channels, Com-puter Network Technology claimed. The company said it plans to introduce a multi-channel fiber-notic link het-5100/Rs, based on the Fiber Distributed Data Interface industry standard. It did not give a date for the release. The 5100/R's T1 networking capabili-

ties include load leveling, alternate rout-ing and error checking. Optional network management features include network usage, monitoring and diagnostics. The link 5100 family supports a range of existing IBM mainframe applications including Virtual Terminal Access Meth-od and Remote Job Entry, according to Computer Network Technology,

The system is priced at \$70,000 for a point-to-point, dual-T1 link between two mainframes, which includes a \$100/R for each system. The vendor said the 5100/R will be available in quantity by the end of



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ciates, Inc. has unveiled Re-motetalk, which is personal er-to-PC synci nications software said to

... c offer both remote-contros and transfer capab tetalk runs on IBM Pe al Comp

n

ters and compati bles and communicates via IBM's Synchronous Data Link Control protocol. The remo troi capabilities allow two

PCs to link together as one. Files T s can be transferred in foreground or background mode. Remotetalk operates at up to 19.2K bit/sec. Features include an interactive message window

sword protection, data com-ssion, an idle timer and Help. Remotetalk costs \$295. Network Software Asso-ciates, 22982 Mill Creek, Lagu-na Hills, Calif. 92653. Traveling Software, Inc. has announced Lap-Link, a serial-transfer kit for use between IBM-compatible laptop and

skton comouters Lap-Link is said to achieve a m data transfer rate of 115.2K bit/sec. as well as allow the transfer of individual files, di rectories and entry disks. The user can specify files for transfer by DOS wild cards, by the date

on which the files were created or last modified or by selecting those files on one computer that are different from those on the Lap-Link costs \$129.95. Traveling Software, 19310 N. Creek Pkwy., Bothell, Wash.

Headlands Communications Corp. has announced PC-Talk4, an enhanced version of ware for the IBM Personal Com

PC-Talk4 features the Xm dem CRC error-checking proto-col. screen emulation of Digital Equipment Corp.'s VT100/52 and expanded macro capability

Other features include on-line

Other features include on-line data transfer rate changes, a si-lent mode, a dedicated hang-up command and 36 user-defined program default settings. PC-Talk4 is priced at \$129. Headlands Communications, P.O. Box 8, Tiburon, Calif. 94920

Network management

Intel Corp. has announced its Multiserver system, including a net of networking services.

The Multiserver system is

said to provide a com networking solution with trans-parent-file access regardless of where the data resides on the

network. It supports personal computers, departmental-level computers and mainframes. According to the ven According to the vendor, Multiserver provides the ability to share resources such as print-ers and peripherals and to ex-change information between computers. Network services

provided include print spooling, acting as a central link between PCs and mainframes and allow-ing a virtual terminal mode to gain access to data or files. Multiserver systems \$15,000

priced from \$30,000. Intel, P.O. Box 58065, 3065 Bowers Ave., Santa Clara, Calif. 95052.

Customer-premise equipment

Message Processing Sys tems, Inc. has anno Auto-Tend, an auto

The microprocessor-b system answers each call with a

company greeting and provides the caller with the opportunity to direct the call without operator assistance. Each system can be expanded from four ports to eight, 12 and 16 ports. Each can process another call once the first has been handled. Auto-Tend is priced from \$12,400 to \$24,340.

Message Processing Sys-tems, 8848 Red Oak Blvd. Charlotte, N.C. 28210.



dure is moun

rent and next-ger is and data base is pressure betw

on compenies to make stratego connectivity decisions given the myriad temporary link fixes on the market and the promises of future deliverables from a single vendor.

sure is peer-to-peer cor pressure is peer-to-peer commu-nications. The answer is Arbiter'.
Arbiter is a VTAM-based, co-operative processing sub-system which was designed to integrate mainfarmes and microcomputers as peers. As a VTAM subsystem. Arbiter is capable of supporting hundreds of PCs simultaneous with higher data transfer rates and

with higher data transfer rates and lower system overhead than CICS-and TSO-based approaches. Pully SNA-compatible Arbiter not only improves the performance

ting networks with LU 2 and devices, but, by design, is atlible and performs opti-

totter's advanced file transitities include application am interfaces (APIs) to ag COBOL, PL/I, Pascal ar mbler applications, and a al-purpose External File see utility in addition. Arbit data base extraction packages (e.g. SAS*) and PC tools like Lotus 1-2-3* and dBASE II* and III.*



Data transfers may be in five or batch, in both direc

active or parch, in both carecasmidirectly or through remote disks using familiar PC DOS command Arbors's dynamic management of VSAM data sets and a more efficient VTAM-based transport whiche result in a superior implementation of the virtual disk

concept.
Arbiter addresses major security considerations by complete integration with RACE CA-TOP SECRET and ACE2* Arbiter also generates SMF records to provide information for accounting auditing and network and CPU performance

asurement.
With Arbiter, management
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management of the micro/ma ment is based on an organiza-tion's policy rather than technical product limitations.

So, to find out why Arbiter is without peer call flangarm Systems Corporation today at (979) 481-4444. Ask about putting Arbiter to work immediately with a trial evaluation.

SYSTEMS CORPORATION RO. Box 50 Cary NC 2751

NETWORKING

Octel Communications Corp. has in-troduced Aspenlink, a transaction pro-cessing software product said to provide access to information in a computer data

se by using the telephone.

According to the vendor, Aspe tegrates voice messaging, call processing and transaction processing applications on one system. Application-specific soft-ware works with the Aspen Voice Prohost computer and the caller.

The Aspenlink interface is available for use with the IBM System/36 and 38 and IBM 3270-type terminals. It is sold as a software option on Aspen voice process-

Aspenlink Transaction Processing software costs from \$10,000 to \$25,000 Tra Octel Communications, 890 Tasman Drive, Milpitas, Calif. 95035.

Ansa Software has amounced a struc-tured query language (SQL) mainframe connection for Paradox, its relational data base management program for IBM Per-sonal Computers, called PC/SQL-link. PC/SQL-link's meno-driven SQL gen-erator is said to allow Paradox users to

gain access to and transfer data stored on IBM's DB2 and SQL/DS relational data base systems without leaving the PC envi-ronment. Data can be reformatted, analyzed and manipulated on the PC. Paradox users can also upload data stored in Para-dox to host relational tables on main-

Paradox and PC/SQL-link costs from \$14,900 to \$19,800 for a host license and from \$295 to \$495 for the PC license. Ansa, 1301 Shoreway Road, Belmont,

Protocol converters

ens Data Switching Systems, as announced the Advanced Network Processor 1220, an X.25 con-

The concentrator is said to provide ac-cess to X.25 networks for non-X.25 ter-minals. It also permits multiple terminal users to share access to a single X.25 line. The Advanced Network Processor 1220 ensures X.25 compatibility with IBM Binary Synchronous Communications (BSC) 3270, IBM BSC RJE , IBM Systems Network Architecture/Synchron-ous Data Link Control, asynchronous and X 25 attachments

The Advanced Network Processor 1220 is priced at about \$5,000. Siemens Data Switching, 186 Wood Ave. S., Iselin, N.J. 08830.

Electronic mail

C&W Incotel Ltd. has announced Se-cure Electronic Mail, a software module said to provide automatic auditing fea-tures for message traffic sent via Digital nt Corp.'s All-In-1 office menu

The module is said to prevent unde-tected duplication of any part of a mes-sage, It also makes undetected nondelivery of a message impossible and provides the originator with a detailed deliverystatus report on demand. It automatically handles all monitoring, receipt time-out detection and other integrity factors and provides a display of the original message when receipt status is presented.

Secure Electronic Mail is reportedly

priced at \$6,000 el, 5 Penn Plaza, New

York, N.Y. 10001

Cylink Corp. has announced the Cidec-MS data encryption standard-based meam-speed digital encryptor.
The Cidec-MS operates in full-duplex

rates from 1.2K through 112K bit/sec. It operates in configurations in which a syn-chronous clock is provided by the net-

work or by the customer's terminal equip-ment. It is available with an RS-232C or The Cidec-MS imples etary automatic electronic key manage-

The Cidec-MS is priced at \$2,500. Cylink, 920 W. Fremont Ave., Su ale, Calif. 94087. Modems/Multiplexers Connecticut Technical Corp. has an-nounced a series of Modern Elimina-

ors said to replace a pair of in-hous hort-haul modems and allow local syn onous or asynchronous bidirectional

communications The Modem Eliminators are available for RS-232-, V.35- and RS-422-compati-

for R5-232-, Y.35- and R5-422-compati-ble equipment. A single Modern Elimina-tor is said to permit user equipment to be separated by distances of up to 4,000 ft. Features include front-panel selection

of data transfer rates, clock mode and source, digital loop-back diagnostics, in-terface-activity LEDs and a monitor port. The Modern Eliminators are priced

fron \$250 to \$550 and are available in stand-alone or rack-mount modules. Connecticut Technical, P.O. Box 4607, Stamford, Conn. 06907.

Telenetics Corp. has introduced the Model ED208 synchronous 4,800 bit/ sec. stand-alone modern. The modem is said to function full-du-

plex over four-wire leased lines, conforming to AT&T 208 standards. In a two-wire CCITT leased-line or switched network, the modern operates in half-du-plex to V.27 standards. Over two Continued on page 58



"NET/MASTER Is The Most Complete Network Management Solution Available" Datapro

JES 2 AND JES 3. Plus it gives you p canabilities in the areas of multiple

1-800-543-3010





Continued from page 55 wire, dial-up lines, an X.25 function supts useudo-full duplex.

The modem is said to feature automatic calling and provisions for callback secu-

The Model ED208 is priced at \$1,245. Telenetics, 895 E. Yorba Linda Blvd.. Placentus Calif. 92670.

Raycom Systems, Inc. has announced the Raycom 5000 Series Coax Multiplexer for IBM 3270 systems. The series includes four multiplexer

units. A 32-port unit and a 16-port unit are available for controller site use; a 16port unit and an eight-port unit are available for the terminal site. The multiplexer units are interconnected by standard RG- 62/AU coaxsal cable.

The multiplexers are compatible with Type A IBM 3270 equipment. Each is available with RI-11 connectors. The 32-port controller unit costs \$1.875; the 16-port controller unit is \$1,550. The 16-port terminal unit costs \$1,355 and the eight-port terminal unit is

Raycom Systems, 6395 Gunpark Drive Boulder, Colo, 80301.

Sigma Information Systems has introduced a Digital Equipment Corp.-com-patible eight-line asynchronous communi cation multiplexer designed on a sing dual-wide module, called the SCD-

DHV11/8. All eight lines of the multiplexer are

and to have full modern control with RS-232C and RS-423 operation. Four lines can operate under RS-422. The module

includes a 256-char, buffer for received characters and direct-memory access for transmitted data. Each communication line is independently programmable for word format and hardware-character echo, as well as for solit-transmit and receive-transfer rates up to 38.4K bit/sec.

The SCD-DHV11/8 costs \$792. igma Information Systems, 3401 E. La Palma Ave., Anaheim, Calif. 92806.

Adaptive Computer Technologies has introduced the Act 154, an error correcting compression mode

The full-duplex, asynchrono said to follow the standard Haves Mi-

crocomputer Products, Inc. command et. Act 154 accommodates speeds up to 9.6K bit/sec. over standard 2,400 bit/sec. dial-up lines or up to 4.8K bit/sec, over

1 200 bit/sec lines The modern uses full Communications Regulatory Commission-16 error-check ing code. According to the vendor, the Act 154's data compression results in a high compression ratio on all types of data, performing on text, spreadsheets. data have files, binary object code, computer languages, on-line transactions, in teractive graphics or any combination of

Act 154 costs \$895 Adaptive Computer Technologues 2475 Augustine Drive, Santa Clara, Calif.

Diagnostic equipment

Communications Solutions, Inc. has announced the DIA/DCA Product Assurance Package designed for users of the wandor's Access communication prod-

The package is said to test the cap ty of office systems to support IBM's Document Content Architecture (DCA) and Document Interchange Architecture (DIA) The program allows users to test compatibility with known applications such as IBM's Personal Services software and Discus. It includes the Access/DIA Automated Test Kir, the DIA Compatibilmy Kit the DCA Compatibility Kit and the wandor's Commuter Services The Access/DIA Automated Test Kit

and the DIA Compatibility Kit cost \$6,000 each. The DCA Compatibility Kit costs \$7,000. All three together cost \$17,500. The Computer Services Shared Use Disoss includes unlimited use for up to 20 users for \$5,000 per month. Communications Solutions, 992 S

atoga-Sunnyvale Road, San Jose, Calif. 95129

sive Computing, Inc. has introduced two personal computer-based protocol analyzers, one for decodi Systems Network Architecture protod one for decoding X.25 protocols Both products are for use with the ven-dor's LM1 Line Monitor add-in board.

They are said to interpret and translate the meaning for every bit and byte in th data communications protocol. The LM1 operates at up to 72K bit/sec. full duplex. The SNA and X.25 software cost \$295 each The LM1 board costs \$1.595

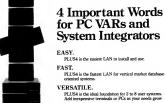
Progressive Computing, 28 Green wood Court, Glen Ellyn, Ill. 60137. Control Systems Technology, Inc.

bas introduced a portable, battery-oper-ated data line monitor called the CST Dataprobe I.

The unit is available with asynchro-

nous and optional synchronous protocols including Binary Synchronous Control, Synchronous Data Link Control, H Data Link Control. Systems Network Architecture and X.25. According to the vendor, it can achieve data rates of up to 19.2K bit/sec. It offers communications protocol analysis, data network monitorent installation, product deopment and systems integration capa-

Dataprobe 1 is priced from \$1.195 to \$1,495 Control Systems Technology, 19045 Cherry Bend Drive, Germantown, Md



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SYSTEMS & PERIPHERALS

lames Connolly

A mainframe

market stall

The situation has not reached

standing on a corner watching

the world pass by. But quite a few people have been tentative

about moving in the mainframe

In addition, if conversations

drames will pick up by the

with MIS managers and recent surveys are indicative, predic-

tions that the market for new

market for longer than most

the point where everyone is

Sierra CPUs bump XA's limits the board, make NAS the first vendor to bump up against the

Part of the increase so main

nemory resulted from the re

placement of the processor fam-

ily's existing 256K-bit random

access memory (RAM) chips

with parts that are four times

more sophisticated. But the ad-

dition of 1M-bit RAMs is only

half the story behind the AS/

NAS's recent adoption of 64K-

byte storage protection arrays.

the densest in industry history.

according to Carl Claunch, the

company's director of system

marketing. Previously, all five models in the AS/XL series used

To understand why improved

prage protection is so crucia to the company's latest hard-

The other half has to do with

XL's expanded capacity.

16K-byte arrays.

NAS machines hit 2G in memory, signal revaluing of architecture

BY JEFFRY BEELER

ANALYSIS

(XA) still probably has a number of years to go before it reaches the end of its useful life. But technology is already beginning to overtake XA, as a recent hardware announcement by National Advanced Systems Corp

(NAS) demonstrates. Included in the a ment was word that NAS has technologically overhauled its entire AS/XL mainframe series to allow the Sierra-class ma chines to expand to 2G bytes of main memory, the largest amount XA can architecturally accommodate. The refinem

line's internal storage size across

third quarter of this year may be off the mark More not fewer managers seem to be reporting in informal ersations that they are set for CPUs this year or that an inexpensive upgrade will suffice for not only this year but 1988 as well. With the caveat that most of these statements came in daytouday conversations, rather than a formal survey, it is app ent that mainframe grow may have stabilized to a degree where the best times of the product cycles for the IBM 3090

and its equivalents are past.

Even managers questioned after IBM enhanced the 3090s two months ago frequently report that they have enough com puting power or enough op-tions - such as used IRM 3080s. - to last them well into 1988 or 1989, when analysts predict IBM will be offering a third geo eration of 3090s or perhaps even moving toward the 3090's re-Continued on page 62

IBM's Extended Architecture

which quadrupled the AS/XL

some basic knowledge of how

IBM CPUs manage their main

Series/370 architecture divides its internal storage into pages containing a specified number of kilobytes. To ensure data integrity, the architecture further requires the systems to maintain a fixed proportion of main memory to storage protection, which prevents a bug in one program from causing trouble in another. The more RAM a mainframe supports, the more stor age protection it demands. Like the AS/XL senes. IBM's recently introduced 3090E fam-

ily incorporates 1M-bit compo-nents. But because the circuit technology is shackled with 8Kbyte storage protection arrays.

Continued on page 68

EMC adds memory for 3080s

NATICK, Mass. - EMC Core has moved into the IBM mainframe add-on market with the ingrades for IBM 3080 host

According to EMC officials the upgrades have a 30% price advantage in companion with IBM memory upgrades.

The product follows our introduction of main storage up grades for IBM 4381 computers and Powercache-16 cache storage upgrades for IBM 3880 storage directors," said Greg Strakosch, sensor product manager for EMC's large systems group. We are continuing to look

for ways to provide IBM main frame users with cost-effective system-enhancement products We want to give these users the same performance and reliability improvements that we've been offering mini and superminicon puter users for years," Strakosch added

The upgrade uses 256K-bit memory chips and is supported with a standard lifetime warran ty which includes a novcost replacement of the upgrade for any

reason, according to the compa A 16M-byte upgrade costs

\$110,000.

Inside

 Sky Computer puts out near supercomputer Vortex accelerator boards. Page 62.
 The Bank of Tokyo Ltd. as to extend its inte

enal hanking network Palantir Corp. enha

Data View

Market trends IBM 4300s and Digital Equipment Corp. VAXs still vie for different markets



HP pits 330 vs. Sun. DEC

BY NINAMARY BUBA MAGINNIS

PALO ALTO, Calif. - Hewlett-Packard Co. is aggressively eye ing the engineering workstation market with the recent debut of its HP 9000 series Model 330 workstation, a replacement for the Model 320, according to a Wall Street analyst who moni

display and base price of \$12,700 the workstation is nitsystems, Inc. and Apollo Com-

ted directly against Sun Micro-Peter D. Schleider, senior vicepresident for the New Yorkbased brokerage house of L. F. Rothschild, Unterberg Towbin, Continued on page 64

ITT spices 9000s with MLU systems BY ALAN J. RYAN

TEMPE, Ariz. - ITT Courier

ninal Systems, and recently inced its 9000 series of terals with multiple logical units (MLU) software, adapter cards displays that connect directly to twisted-pair wiring schemes and enhanced controller and display

roduct line, ranges in price rom \$1.445 to \$2.145 for basis dextended function models.

With the MLU software, the Courier 9000 displays will have a higher level of functionality, according to Lowell Coulson, man

ager of product marketing. multaneous sessions per display, up to a total of 128 logical 3270 sessions per controller, the year

Adapter cards and a twistedir version of Courier display nodels permit the use of twist ed-pair wiring between the 900's controller and devices located up to 5,000 feet away, the ITT's director of product

arketing, Walter Nagel, said twisted-pair wiring capability is nonutar because of IBM's Toen-Ring Type III cabling system. "It gamed popularity in the European community, and it is increasing its popularity in the U.S.," he said, "It's just a very cost-efficient manner to connect terminals to clusters.

The enhanced controllers will include Release 12 software. which incorporates features in-cluding compatibility with IBM's Systems Network Architecture Alert diagnostics and support of the MLU and twisted-pair op-

List prices of the controllers will not change, the company 9322 parallel and 9323 serval printer controllers to support printers via twisted pair. Each ** \$1 600

The displays have been en hanced to support multiple logical units and other features pro vided by the Release controller software. Those prices have also remained un changed, Courser said Current users who wish to us

grade can do so through a display ungrade kit, which costs from \$500 to \$2,000, according to the

Connect with network more

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Aid pumps ATs into near-supers

BY ALAN J RYAN

LOWELL, Mass. — Sky Computers, Increcently announced a computer board the firm said can give an IBM Personal Computer AT and some workstations near-supercomputer performance in certain applications.

The Vortex board-level array processor family "addresses a growing demand for near-supercomputer levels of performance on scientific/engineering workstations," said Howard Klemmer, the company's chief executive officer.

"The idea of this whole product area... is to bring the price of near-supercomputing down to a practical and affordable

puting down to a practical and affordable price range." Klemmer added.

Designed for high computation Vortex was designed for use in a variety of scientific applications that require high

scientific applications that require high computation, including geophysical, mechanical computer-aided design (CAD), electrical CAD, simulation, aerospace and computational graphics. These applications involve number-

crunching computations in the 5 to 10 million floating-point operations per second (MFLOPS) range, according to the

vendor. "We're not replacing their supercomputers by any means, but if you have an application that requires intense number crunching, it's not necessary to go out and buy a supercomputer for that," Sky snokesman Bruce Nelson said.

Spokesman Bruce Nelson sand.

The Vortex family reportedly works with workstations based on the Intel Corp. Multibus II memory bus and the Texas Instruments, Inc. Nubus.

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Ohio: 216/464-6688 513/531-0688

Kentucky: 502/499-6656

Utah: 801-544-0444

Illinois: 312/773-2300

California: 818/718-0073 714/220-6487 619/268-4730 Nelson said Sky is working to make the Vortex compatible with the VMEbus. The Vortex can execute 20 MFLOPS

The Vortex can execute 20 MFLOPS in single-precision (32-bit) mode or 10 MFLOPS in double-precision (64-bit) mode, the vendor claimed.

"Many researchers and many of the OEMs who would like to get lnear-supercomputer performance really can't afford to pay large amounts of money for the machine. This can give them that performance," Klemmer said. "It really becomes a substitute process for gury who can't afford to jump up to the big mis-

The board is priced at \$9,900 for the PC AT version. Prices for the Multibus II. Nubus and VME versions start at

\$11,900.
Prices vary depending on memory options. Deliveries are scheduled for 90

days.
The \$9,900 versions include a baseline arithmetic unit, a processor with 1M byte of on-board memory, documentation and software intrary routines.

Mainframe CONTINUED FROM PAGE 59

placement, nicknamed Summit.

Of course, IBM is not the only company dealing with the mainframe market.

of ceaning with the maintraine market showdown.

It is just that IBM controls 75% or more of the maintraine market. Some of the managers reporting nonacquisition plans run IBM play compatible equipment from companies such as Andahl Corp. and National Advanced Systems Corp. and IBM-incompatible vendors now at lifeient Corp. Somewhat Islainer Corp. Somewhat Islainer Corp. Somewhat Islainer Corp. Somewhat Islainer Corp.

ment from companies such as Amdahi Corp, and National Advanced Systems Corp, and IBM-incompatible vendors consuch as Unisys Corp, formerly Burroughs Corp, and Sperry Corp, and Honeywell, Inc. All of these companies are likely to say their systems are selling well and are likely to have statistics to support those claims. But what should be of concern to all

But what should be of concern to all vendors is the undercurrent in the user community. There is a feeling that customers can-

not or should not buy new mainframes.
And despite the claims of downstring advocates, the customers are not basing
their decisions solely on the availability
of smaller systems or microcomputers
that can be networked.

3080s goin popularity
A late-1986 user survey by International Data Corp., a Framingham, Mass., market research firm, found that used 3080s
were gazning popularity, while lower end
3090 models fell out of favor.
The reasons for managers opting for
standing pat or going with minimal up-

grades are as varied as the companies in the Fortune 1,000.

One may cite a downsizing strategy, but another may mention a downturn in

but another may mention a downturn in his own company's profits. One may talk about a lack of functional differentiation between the 3080 and 3090, while another will say her compa-

3090, while another will say her compayinvests heavily in equipment only every three years and that last year was its year to spend.

The bottom line is that there may be little room for optimism among those watching for the maniframe market to

Connolly is Computerworld's senior editor, sys



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The Networking Experts

The paradox of power.

The Information Age, for all is potential has brought with it a new kind of problem. Often, the machines that contribute so much to the flood of information do little to help most of us cope with it. They are difficult to use, rigid in their demands, almost arrogant in their inability to work with any but their own kind. They are the muscle-bound tools of specialists.

In our view, the problem is not that the machines are too powerful for the rest of us. They are not powerful enough.

This is the paradox of power, the more powerful the machine, the less power it exerts over the person using it. We define a more powerful machine as one that is more capable of bending to the will of humans, rather than having humans bend to its will. The definition is deeply ingrained in AT&IT the telephone is such a powerful device precisely because it demands so little of its user.

ATMT foresess the day when the Information Age will be Information Age will become universal People everywhere will participate in a worktwide Telecommunity. They will be able to handle information in any form—conversation, data, images, text—as easily as they now make a phone call.



That day is coming closer. One example scientists at ATAT Bell taboratories are developing associative memories for computers, further enabling the machines to work with incomplete, improcess, or even contradictory information. That's perfectly natural for a human What makes it a breakthrough is that these computers word ask you to be anything else. Telecommunity is our goal.

Technology is our means.

We are committed to leading the way.



HP pits 330 CONTINUED FROM PAGE 59

The Model 330 delivers two million instructions per second and operates with a Motorola, Inc. 68020 microprocessor and Motorola 58881 floating-noint coprocessor that run at 16.67 MHz, the vendor ims. Basic models come equipped with 4M bytes of memory with an option to ex pand to 8M bytes. The 32-bit wide I/O s provides 6M byte/sec. bandwidth to high-speed peripherals yet remains com-mathle with earlier Series 300 interfaces

and peripherals, HP said The 330 is targeted for engineers, scitists, programmers and architects and supports computer-aided engineering and gn applications for test measurement software development and electrical and cal design. HP is vying for the Apollo DN 3000. Sun 3/110 and Digital Equipment Corp. Vaxstation II workstarkets, the vendor said.

The 9000 series installed base in ides 60.000 workstations, com with Sun's 30,000 and Apollo's 35,000 Schleider noted. "So HP almost solo almost sold twice as many - but not in the same man kets. Now they're starting to address

se time and traffic statistics per

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those other markets and will leverage unit volume to do that. They made a commitment to it and now have got to get third parties to support the [HP-] UX operating system," he said.

instrumentation largest soles HP's largest workstation sales to date have been in instrumentation, instru controllers, medical and analytical busiess markets, Schleider said, Now the firm is developing application software for computer-aided software engineering markets, the analyst said. "So, they're really going after mechanical develop ment software themselves or contracting

others to do so," he added Four Model 330 configurations come indard with keyboard, display, cabling, IEEE 802.3 local-area network port, RS-232C interface, two-channel direct-memory access controller, HP Hu man Interface Link and four-slot card Hardware options include an HE DOS coprocessor for personal computer oplications, a high-speed disk interface

four-port RS-232C multipl ander, disk storage up to 571M bytes

Four operating systems are available for the Model 330. HP-UX, a Unix-based operating system, is compatible with face definition and has passed the System

Release 3 validation s Under HP-UX, the Model 330 is obt-code compatible with other Serie 300 systems and source-code compatible with HP Precision Architecture HP 9040

Model 840. A single version of an app tion will run on either model. HP said. HP Basic 5.0 is enhanced for instru ent applications. Basic provides extensive structure-programming features, high-level graphics capabilities and predead mathematical and string functions HP Pascal is offered for its compiled

program performance and efficiency for high-level or complex programs, the ven-dor said. The Series 300 HP DOS co-processor card turns the Model 330 into a personal computer, with access to IBM PC AT-compatible software.

The Model 330 is available in fo kages. Model 330C includes the HP-

UX Applications Execution Envir and a 16-in. color display with 1,024- by 768-pixel resolution that provides six planes of color for two-dimensional appliand personal or high-performance engi-neering plotters and printers. cations such as circuit design. Base price The Model 330M includes the HP-UX

plications Execution Environment and 7-in monochrome display with 1,024by 768-pixel resolution for applications such as software design, schematic entry. office automation and electrical-design. The 330M lists at \$12,700. odel 330CMA includes a 12-in. color

play with 512- by 400-pixel resolution in four planes, HP Basic 5.0 and high speed disk interface. Designed for appli cations such as measurement-autom cations such as measurement-automation software design and high-performance in-strument control, it costs \$15,900. Model 330MMA has a 12-in. mono-chrome display with 512- by 400-pixel resolution. HP Basic 5.0 and high-speed

disk interface. For applications such as in-strument control, the Model 330MMA

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a will round up the culprats.

strate gamaucik in the system and or day to day costs and equipment

(Hat not metaded.)

Bank of Tokyo inks \$16.5M Tandem deal

The Bank of Tokyo Ltd. says it will extend its international banking network by adding \$16.5 million worth of Tandem Computers, Inc., Nonstop transaction processing mainframes. As part of the second phase in its worldwide network implementation, the bank says it plans to extend the network to include Tokyo, New York and London. Sites will be linked in an on-line banking network with a Nonstop VLX at each site. The international network will handle funds transfer, connect personal computers, interface to wire-service carriers and facsimale transions het ween bank offices.

dian gove Convex Computer Corp.'s C-1 minisu-percomputer to form the nucleus of the ismic reflection data processing opera-ns for the Hibernia oil field, recently scovered off the coast of Canada.

Convex was also the choice for Wok-ing, England's Spectrum Energy and In formation Technology Ltd. Spectrum will use the system in seismic reflection surveying for land and marine hydrocarbon exploration, borehole seismic surveys and information technology, says Paul Blundell managing director

BBN Advanced Computers, Inc. re-cently sold four of its Butterfly parallel processors. Indiana University nas a ISM-byte. I-processor model with floating-point processors that the school will use for designing parallel complers, graphic, artificial intelligence applica-tions and genetic algorithms. Mirre Corp. installed a 32M-byte, eight-processor model for Al applications. FMC Corp. has a 12M-byte, three-processor Butterfly with these floatings only processors, and ocessors. Indiana University has a with three floating-point processors, and the Naval Research Laboratory bought a 128M-byte, 32-processor model that it will use for a range of computer-int

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Tandem Computers, Inc. and Syn-tech International, Inc. have signed an agreement to jointly market an integrated on-line lottery system. The M on II lottery system will include a Tandem Nonstop computer and Syntech player-activated terminals, clerk-activated terminals, video lottery terminals as applications software.

Researchers at the University of Illi is have developed a semiconductor itching mechanism they claim is so fast that current testing equipment cannot measure it. The diode will probably be

used to improve communication devices supercomputers, the researchers say.

The heterostructure rostructure hot-electron diode, or H*ED, is made of gallium arsenic ode, or HPED, is made of galatum artenide, and shuminum gallium arcenide, layered by metal-organic chemical vapor deposi-tion, a process for depositing microscopi-cally then layers of semiconductor materi-als. The HPED was developed by ctrical and computer engages

three doctoral students.

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Sierra CPUs

ory is restricted to 256K bytes. just an eighth of what a fully con-figured AS/XL-90 or AS/XL-100

Likewise, Amdahl Corp.'s 890-series processors are equipped only with 16K-byte ar-

rays and are therefore con ned from expanding beyond 512K bytes of internal storage. Someday, both IBM and Amhi will reportedly follow NAS's

lead and upgrade their own stor age protection arrays to 64K bytes. When they do, all three vendors will again be on an equal footing, at least from a main

On that fateful day, however,

the companies will have jointly reached a storage-capacity im-passe beyond which none will be

able to proceed without fundamental changes to XA itself, ac-Why does current IBM archi tecture prohibit the direct addressing of more than 2G bytes of real storage? The answer lies in the size of the registers that are allowed under XA. Although

the registers in IBM-style mainframes are theoretically 32 bits wide, only 31 of them are avail able for addressing. The remain-ing bit is reserved by the software for control purposes

So what does the future hold for XA? What will happen when the technology in all IBM systems has advanced to the point that further refinements become

tectural framework is no longer adequate to house them?

Eventually, IBM will be forced to extend its architecture yet again. But by what means the extension will be accomplished - and at what point Big Blue will stake its next addressing bound-

— no one can say for sure. In theory, IBM could circu vent the current 31-bit limit by implementing "shadow regis-ters" and developing an as-yet-unknown kind of software to load and manage them. Under such a scheme, each existing IBM regscheme, each existing BM reg-ister might have behind it a shad-ow register, which could hold a certain number of additional bits," according to Carl Amdahl, former designer for Magnuson Computer Systems, Inc.

But although the use of shadow registers could undoubtedly overcome XA's existing barri-ers, the technique would also exact a heavy toll on both price and performance. "The more bits a more its hardware costs and the more time it needs to generate an address," Amdahl said. For those reasons, shadow registers remain firmly entrenched in the realm of industry speculation.

Palantir enhances processing

SANTA CLARA, Calif. - Palan tir Corp. has announced the Compound Document Processor 3000 Extended Functions enhancement of the firm's Docu-ment Processing System. The CDP 3000XF is said to offer new functionality for forms process ing, electronic publishing and

The extended functions p ists of the CDP and Pro Series Software that enables document entry and verification automatic data capture, con sion, checking and correction The CDP 3000XF includes ex inded character recognition, ditions to the special character set and support for dot m print, Palantir said

The CDP 3000XF reportedly can read degraded characters, poor-quality photocopies and characters on or touching vertical or horizontal lines

Customers with exi 3000s can upgrade free of charge if they have an on-site third-party maintenance agree-ment with Eastman Kodak Co., Palantir said. Customers withou a maintenance contract can pur chase the YF enhancement at \$2,500 per machine.
The CDP 3000XF lists at

\$39,500 and is deliverable with in 30 days, according to the ven

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COMPUTERWORLD

A CWO Publication

N E W Turnkey systems

om Systems, Inc. has an-nced the Vicom-VME, a desk-side workstation con ing a Sun Microsystems, Inc. in-3 microcomputer with Vicom's image processing on the

ame Motorola, Inc. VMEbus. The Vicom-VME is said to of for separate modules for image acquisition, processing and dis-play. Real-time image process-ing needs are handled through a real-time operating system, sep-arate from the University of Cal-

ifornia at Berkeley Unix Version

R

ODUCTS

4.2 operating system.
In addition to image processing, the Vicom-VME is said to function as a Sum-3 workstation for handling other tasks. It can run standard Sum-3 software and can be networked with other Sun workstations or other cor systems.

Vicom-VME is priced from The modules were designed so that the process industry user \$68,000 for a complete workstacan interface the HP 48000 with

Vicom Systems, 2520 Junc-tion Ave., San Jose, Calif. 95134. a variety of field instrumentation

Processors

such as pneumatic-control valves, process-chart recorders, motor-starter circuits and ther-

motor-starter carcuits and thermocouspic input.

The modules include an aschated digital input module, an isolated digital relay output module, as isolated digital relay output module as isolated digital relay output module and a thermocouspic/analog Hewlett-Packard Co. has in-troduced five I/O plug-in mod-ules for the HP 48000 RTU ement and control unit.

input module. The HP 48000 backplanes

were designed to accept three, six or 11 plug-in modules. Prices range from \$1,200 to \$1,600 each, plus a master control module and a power-supply module.

Hewlett-Packard, 1820 Em-barcadero Road, Palo Alto, Calif.

Bice-Vero Electronics, Inc. has announced a small computer systems interface (SCSI) host adapter board for the Motor-ola, Inc. VMEbus.

The board is said to imple-ment full SCSI functions includ-

ing arbitration, disconnect, re-connect, parity and synchronous or asynchronous data transfers. The board features direct-mem ory access transfer ability over the VMEbus and 512K bytes of dual-ported memory. The VME-bus interrupt and bus request may be sent to any level.

The board with direct-men

ry access and memory costs \$885. Without dual ported ran dom-access memory (RAM), it costs \$585. Without RAM or di-rect-memory access, the board costs \$485.

Bicc-Vero, 1000 Sherr Ave., Hamden, Conn. 06514.

Data storage

EMC Corp. has upgraded its Falcon series disk subsystems for the Hewlett-Packard Co. HP

The Falcon I is now said to provide 406M bytes of storage, and the Falcon II offers 812M bytes. These new capacities are said to give the Falcon I a maxi cities are mum storage capacity of 1.6G bytes per cabinet and the Falcon II a maximum of 2.4G bytes per

The Falcon series features EMC's disk-cache processing cards, which include an on-board Motorola, Inc. 68000 microprocessor and 4M bytes of highspeed cache per card

The Falcon I costs \$12,900; e Falcon II costs \$23,400. EMC, Natick Industrial Centre, Natick, Mass. 01760.

Force Computers, Inc. has announced the ISCSI-1, a massmemory controller for small computer systems inter (SCSI) applications in Moto Inc. VMEbus environments. interface The 10-MHz controller is

based on a Motorola 68010 mi-croprocessor featuring high-speed direct-memory addressing channels that are coupled t -disk controller

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chips. It features a 128K-byte dual-ported random-access memory and is capable of acting as a host controller to any num-ber of SCSI drives and up to four loppy-disk devices simulta-

The ISCSI-1 is priced at \$3,890. Source code and docu-mentation for the firmware costs 13,950

Force Computers, 727 Uni-ersity Ave., Los Gatos, Calif.

Terminals

Evans & Sutherland Interactive Systems Division has an-nounced the PS 390 computer \$6,495

The PS 390 is said to allow calligraphic-quality lines and sol-id-shaded images to be displayed on a single raster. It offers an el ctive resolution of 4,096 by

ster display. According to the vendor, the PS 390 is capable of rotating three-dimensional wireframe dels in real-time and locally idering static-shaded images on a full screen or in user-selected windows. Other features include depth cuing, perspective and six-plane clipping. A palette of 16.7 million colors is available.

The PS 390 is priced from

Evans & Sutherland, P.O. Box 8700, 580 Arapeen Drive, Salt Lake City, Utah 84108.

Modgraph, Inc. has an-nounced the GX-1105-19, a 19-in. version of its GX-1105 color graphics terr The terminal is said to offer a 1,024- by 768-pixel display and a selection of 16 colors from a palette of 4,096. It offers emulation of the Tektronix, Inc.

4105/4010/4014 ics con s. As an aiameric terminal, it em lates the VT100/VT52 with a 5-The GX-1105-19 is priced at

Modgraph, 149 Middlesex pk., Burlington, Mass. Tnpk., 01803.

Power supplies

L/F Technologies has intro-duced the VDT Guardian Ter-minal Pak, an on-line, uninter-ruptible power supply designed

The VDT Guardian comwith a 2.7 ampere-hour battery, ding 15 min of battery up. In the event of a black-VDT Guardian provides gh time for the user to close cest. all files and exit cleanly from the

system, the vendor said. VDT Guardian installs under the base of the terminal. According to the vendor, a user plugs inal power cord into the VDT Guardian enclosure and plugs the VDT Guardian into the

The VDT Guardian Terminal Pak is priced at \$149 per termi-L/F Technologies, 2800 ockheed Way, Carson City, Nev 89701

RTE Deltec Corp. has added 8- and 10-kVA models to its 7000 series Uninterruptible ver System product line.

tems are said to asre on-line, regulated, com ous single-phase ac power for computers and other critical de LED status indicators, digital readout, smart static tran fer switch and a manual bypa

The 8- and 10-kVA mod are priced from \$12,000. RTE Deltec, 2727 Kurtz St., San Diego, Calif. 92110

Auxillary

Gryphon Systems has intro-duced the Temperature Sentry, a temperatu

ol device for Digital Equipment Corp. VAX computer

The Temperature Sentry is id to perform as a guard against unanticipated changes in temperature by reporting any inses through warning mes sages and, as a programmab option, shutting down the com-puter system when the tempera-

re deviates from acceptable The Temperature Sentry ets \$1,395.

Gryphon Systems, 611 Wiger me, Walnut Creek, Calif. Input devices

Eastman Kodak Co. has an-nounced the Kodak Reliant ber code scanner and Kodak bar code DE software mod-

The Reliant bar code scanner for the Kodak Reliant intelligent microfilmer 2000 and Kodak bar code DE software modules for the Kodak KAR-6600 and KAR-8800 information s said to allow simul tion systems are crofilming and data entry in one pass. The scanner interprets bar codes that can be preprinted on forms to provide indexing information for later computer-asvoice numbers can be captured automatically without operator The bar code software for the

KAR-6600 or KAR-8800 costs \$8,500. The scanner for the Reliant 2000 costs \$15,500. Kodak, 343 State St., Roch ester, N.Y. 14650.

Anintenance equipment

Allied Electronic Services, Inc. has announced the Twin-axial Cable Tester. The cable tester can test a

ingle cable before installation or one or more cables connected in a series with display stations or printers on the IBM System/34, 36 or 38 or IBM 5260, 5280 or 5290 computers. It consists of a nacket-size terminating box. a hand-held test selector box and

an optional hand-held ohmme ter can diagnose include open shield, open copper wire, open silver wire, copper wire shorted to the shield and silver wire shorted to the shield. The Twinaxial Cable Tester

sts \$98.95 alone and \$124 with ohmmeter.
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P.O Box 819, Lebanon, N.H. ted retrieval. Data such as in

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results and continue. Also, unlike other systems, Symbolics' multi-processing environment allows you to use the editor and all other programming tools to determine the cause of an error, without throwing away the

Fastest edit-compile-debug loop To make a change to a program on con-ventional systems, the changed file must be written to disk, compiled, linked with other files, loaded, and then executed. To do this for every bug and change is very time con-suming. With Symbolics, only the change is recomplete, linking and all other steps are eliminated. Where conventional systems might require hours-to relink and reload hundreds of files for one change, it takes Symbolics

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Built-in facilities, automatic des type checking, advanced debugging, and fastest edit-compile-debug loop give Symbolics systems the best environment for prototyping applica-tions. While others are still writing specifications, on a Symbolics sysa demo or prototype application.

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32-bit data turbo charged The performance of gardine collection and data-type checkers are improved by and data-type the same are improved by Symbolics' super 36-bit design. Dedicated bits are used to reduce the size of data stor-age at the catabitish and check data-types. Symbolics supports IEEE standard 32-bit floating point formats.

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argest installed base for AI Symbolics has over 3000 sys

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in a wife range of applications; the

Transparent networking Transparent networking Upwards of "yell all Symbolics systems delivered to define are used in heterogeneous warms awar. That because Symbolics is the only offered that networks transparently to UNGA." Delivaria" and IBM One simple remaind is all it takes to access information with these systems, because the Symbolics whose systems, because the Symbolics who was the proper protocols. Also, Symbolics supported to initiate the proper protocols. Also, Symbolics supported to the symbolic symbolic supported to the symbolic supported to the symbolic symbolic supported to the symbolic symbolic supported to the symbolic symbol

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Comprehensive integration of stationary computer languages; Symbolics offers full apport of a range of industry standard languages. Using Symbolics workstations, software Lan be written in Common Liap, Protog Jevtran-P. Pascal and Ada. *No matter which language you use you list lib a bid to take selvantage of Symbolics' built in fasilities, rapid protytyping and reduced maniplenance features. There's no jeed for anyone b) learn a new ure/ramming language.

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IN DEPTH

Fighting for the user

Human engineering, once seen as the paint at the end of the project, is now understood to be the steel frame on which to build the structure

BY BEN SHNEIDERMAN

rustration and anxiety are a part of daily life for ny users of computer-information syss. These users strugtion systems that are supposed to help them do their jobs. Some people encounter such serious cases of computer shock, terminal terror twork neurosis that they avoid using computerized sys-tems. These electronic-age mal-

adies are growing more common, but help is on the way. Researchers have shown that redesign of the human-to-computer interface can make a sub-stantial difference in learning time, performance speed, error rates and user satisfaction. In-formation and computer scientists have been testing design al-ternatives for the impacts on these human performance mea-sures. Commercial designers recognize that systems that are easier to use will have a competi-

tive edge in information retriev-al, office automation and personsurance teams are becoming more cautious and paying great-er attention to the implementa-tion issues that guarantee quality user interfaces. Computer center managers are realizing that they must play an active role

in ensuring that the software and of computer science at the University of Maryland at College Park and head of the Human-Interaction Library at the university's Center for Automation Re-search. This article is excerpted from B. itmeiderman. Dangning the User In-terface, 1987, Addison-Wesley Publish ing Co., Reading, Mass. Reprinted with



ality service to users. In short, e diverse use of computers in ones, offices, factories, hospitals, electric power control cen-ters, hotels, banks and so on is stimulating widespread interest in human factors issues. Human gineering, once seen as the int put on at the end of the pro-

steel frame on which the struc-

Stand up for users However, an awareness of the problems and a desire to do well are not sufficient. Designers, to the most and a desure to do well be not sufficient. Designers, anagers and programmers ust be willing to step forward ad fight for users. The enemics

incomplete instructions, complex error recovery procedures and misleading or threatening I believe that progress in

serving users will be rapid be-cause as examples of excellence proliferate, users' expectations will rise. The designers, manag-ers and researchers who are dedicated to quality and to nurturing the user community will have the satisfaction of doing a users they serve. The battle will not be won by

angry arguments over the user

tems or by biased claims that "my design is more natural than your design." Victory will come to people who take a disciplined, iterative and empirical approach to the study of human performance in the use of interactive systems. More and more, sysmance data from users, distrib-

uting subjective satisfaction surveys, inviting users to participate in design teams, conducting repeated field trials for ducting repeated held trials for novel proposals and using field-study data to support organiza-tional decision making. Marshall McLuhan once ob-served that "the medium is the

· Beating terminal terror and network neurosis

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A Comparative Seminar Of SUPRA And DB2.



parison of SUPRA Release 1,3 and Release 2 of DB2. She'll demonstrate why Dr. Codd concluded that SUPRA adheres to 10 of his 12 basic rules for the relational model, versus DB2's 7 of 12, and explain why he stated, "SUPRA's rating is the highest achieved of all those I have reviewed to date."

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e." Designers send a message to by the design of interactive systems. In the past, the message was often an unfriendly and unpleasant one. I be-lieve, however, that it is possible to send a h more positive message that coneys the concern a designer has for users. If the users feel competent in using the system and can easily correct errors and sh their tasks, then they will pass on the message of quality to the people they serve, to their colleagues and to their friends and families. In this way, each designer has the possibility of make ing the world a little bit warmer, wiser,

Overcoming onimism
The emergence of computers is one of the fundamental historical changes. In his book, The Third Wave (William Morrow & Co., 1980), Alvin Toffler describes this third wave as the successor to the agricultural and industrial revolutions. Such up heavals are neither all good nor all had but rather the amalgam of many individual decisions about how a technology is appied. Each designer plays a role in shap-ing the direction. The computer revolu-tion has passed its infancy, but there is still tremendous opportunity for change.

The metaphors, images and names sen for systems play a key role in deers' and users' perceptions. It is not surprising that many computer system signers still derive their inspiratio orsupers sun oerree their inspiration by mimicking human or animal forms. The first attempts at flight were to imitate birds, and the first designs for micro-phones followed the shape of the human

Eventually, human needs and the un derlying technology shape products to maximize service and reduce cost. Such primitive visions may be useful starting ints, but success comes most rapidly to people who move beyond these fantasies nd apply scientific analyses. Except for amusement, the goal is never to mimic human form but to provide effective service to the users in accomplishing their tasks. Lewis Munford, in his classic book Technics and Civilization (Harcourt Brace Jovanovich, Inc., 1934), characterites the problem of "dissociation of the animate and the mechanical" as the "ob-stacle of animism." He describes Leonardo da Vanci's attempt to reproduce the motion of birds' wings, then Ader's batine as late as 1897 and Branca's steam engine in the form of a human head and torno. Mumford notes that "the most ective kind of machine is the realis mechanical imitation of a man or another animal. . . . For thousands of years animism has stood in the way of develor

the inspiration for some projects is understandable, but significant advances will come more quickly by recognizing the goals that serve human needs and the inherent attributes of the technology em-ployed. Hand calculators do not follow hucan forms but serve effectively for arithmetic. Designers for championship chess-playing programs no longer imitate human strategies. Vision systems re-searchers realized the advantages of radar or sonar range finders and retreated from using human-like stereo depth rec-

Robots provide an informative case study. Beyond stone idols and voodoo dolls, we can trace modern robots back to the devices built by Pierre Jacquet-Drox,

ANY COMPUTER system designers still derive their inspiration by mimicking human or animal forms. The first attempts at flight were to imitate birds, and the first designs for microphones followed the shape of the human ear

Swiss watchmaker, from 1768 to 1774. The first child-size mechanical robot, called The Scribe, could be programmed to write any message up to 40 characters long. It had commands to change lines. nds to change lin skip a space or dip the quill in the inkwell. The second, called The Draughtsman, had a repertoire of four pencil sketches: a boy, a dog, Louis XV of France and a pair

of portraits. The third robot. The Musician, performed five songs on a working pipe organ and could operate an hour and a half on one winding.

These robots made their creators fam-

is and wealthy, since they were in great demand at the court of the kings and in public showings. Printing presses became more effective than The Scribe and The Draughtsman, and tape players and pho-nographs superior to The Musician. Robots of the 1950s included electron-

ic components and a metallic skin, but their designs were also strongly influ-enced by the human form. Robot arms were of the same dimension as human arms, and the hands had five fingers. Designers of modern robots have finally overcome the obstacle of animism and w construct arms whose dimensions are appropriate for the steel and plastic chnology. Two fingers are more com-on than five on robot hands, and the hands can often rotate more than 270 degrees. Where appropriate, fingers have been replaced by rubber suction cups with ourn pumps to pick up parts.

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metaphor and terminology of human form can still mislead the designers and users of robots. In their article, "The language of robots. In their article, "The language or robotics. Use and abuse of personification" ("IEEE Transactions on Professional Communications," 1982). Ellen McDaniel and Gwendolyn Gong note that programmers of one industrial robot were so disturbed by the labels "upper arm" and "lower arm" on the control panel that they scratched them out. They left that the subropomorphic term inside their making promoting term inside their

intuitions about how to program the robot. The term "programmable manuful-tors" or the broader "flexible manufacturing systems" are less exciting but more accurately describe the newer gen-

eration of robot-like systems.

The banking machines offer a simple example of the evolution from anthropomorphic imagery to a service orientation. Early systems were given such names as Tilbe the Teller or Harvey Wallbanker and were programmed with such phrases as "How can I help you?" These deceptive images rapidly gave way to a focus on the computer technology with such names as computer technology with such names as The Electronic Teller, Compucash, Cash-matic or Compubank. Over time, the emphasis moves toward the service provided to the user: Cashflow, Money Exchange, 24-Hour Money Machine, All-Night Banker and Money Mover.

The computer revolution will be judged not by the complexity or power of technology but by the service to human needs. By focusing on the user, researchers and designers will generate powerful yet simple systems that permit users to accomplish their tasks. These tools will enable short learning times, rapid perfor-mance and low error rates. Putting the user's needs first will lead to more approaces of system features, a greater sense of mastery and control and the satisfaction of achievement. At the same time, the user will feel increased responsi-bility and may be more motivated to learn about the tasks and the interactive sys-

ning the boundaries between eople and computers will lead to a clearer recognition of computer powers and human reason, Joseph Weizenhaum notes in his book Computer Power and Hum Reason (W. H. Freeman and Co., 1976) Rapid progress will occur when designers accept that human-to-human communication is a poor model for human-to-con

People are different from computers, and human operation of computers is vastly different from human relation ships. Vital factors that distinguish human behavior include the diversity of skills and backgrounds across individuals; the cre-ativity, imagination and inventiveness incorporated in daily actions; the emotional involvement in every act, the desire for social contact, and the power of intention.

Ignoring these primitive but enduring aspects of humanity leads to inappropri ate technology and a hollow experience Embracing these aspects can bring about powerful tools, joy in learning, the capacity to realize goals, a sense of accomplish

Controlled experiments Clear goals are useful, not only for system

opment but also for educational and professional enterprises. Workers in human-to-computer interaction have three primary goals, influencing academic and dustrial researchers, providing tools, schniques and knowledge for commer-

· Careful selection and assignment of subcial systems implementors; and raising

the consciousness of the general public.

Farly research in human-to-comput interaction was done largely by introspe tion and intuition, but this approach suf-fered from lack of validity, generality and precision. The techniques of controlled psychologically oriented experimentation

can lead to a deeper understanding of the fundamental principles of human interaction with computers The reductionist scientific method fol-

· Lucid statement of a testable hypothe-· Manipulation of a small number of inde ent variables. ent of specific dependent

Control for bissing.

 Application of statistical tests
 Materials and methods must be tested by pilot experiments, and results must be dated by replication in variant situa-

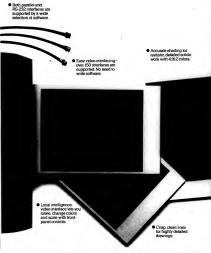
Of course, the highly developed and structured method of controlled experimentation has its weaknesses. It may be difficult or expensive to find adequate sub-jects, and laboratory-like conditions may stort the situation so much that the con ons have no application.

When results for large groups of subjects are arrived at by statistical aggregaFurthermore, anecdotal evidence or in vidual insights may be given too little em-phasis because of the authoritative impact

of statistics. In spite of these concerns, controll experimentation provides a productive basis that can be modified to suit the situation. Anecdotal experiences and subj tive reactions should be recorded; think ing aloud or protocol approaches should be employed; field or case studies with ex-

tensive performance data collection should be carried out; and the individual insights of researchers, designers and ex-perimental participants should be cap-Inred

Within computer science, awareness of the need for greater attention to human tion, extremely good or poor perf mance by individuals may be overlook factors issues is growing. Researchers



who propose new programming language or data structure constructs are more aware of the need to match human cogniaware of the need to make managed graph-tive skills. Developers of advanced graphsystems, robots, computer-assisted sign systems or artificial intelligence applications increasingly recognize that the success of their proposals depends on the construction of a suitable human in-terface. Researchers in these and other areas are making efforts to understand

and measure human performance.

In psychology, there is a grand opportunity to apply the knowledge and techniques of traditional psychology and such recent subfields as cognitive psychology. to the study of humas action. Psychologists are investigating m-solving with computers

to gain an understanding of cognitive pro-cesses and memory structures. The bene-fit to psychology is great, but psycholo-gists also have the golden opportunity to dramatically influence an important and widely used technology.

Researchers in information scien business and management, education, so-ciology and other disciplines are benefit-ing and contributing by their study of luman-to-computer interaction. There are so many fruitful directions for researchers that any list can only be a provocative starting point. Here are several potential research directions:

Reducing anxiety and fear of computer usage. Although computers are widely used, they still serve only a fraction of the population. Many people

avoid using such computerized devices as bank terminals or word processors be-cause they are anxious or even fearful of breaking the computer, making an em-burrassing mistake or being incapable of succeeding. Interviews with nonusers of ters would help determine the

sources of this anxiety and lead to design guidelines to alleviate the fear. Tests could be run to determine the effective-ness of redesign of systems and of improved training procedures.

Graceful evolution. Although novices may begin with menu selection, they

may wish to evolve to faster or more pow-erful facilities. Methods for smoothing the tion from novice to intermittent, inowledgeable user to frequent expert could be studied. The differing needs of

novices and experts in prompting, error messages, on-line assistance, display complexity, locus of control, pucing and informative feedback all need investiga-

Menu selection. Menu selection is offered on many systems for novice users, but there is little data to support design guidelines. The content, number, placeent and phrasing of menu choices could be studied with attention to titling of menu frames, effectiveness of instruc-tions, availability of type-ahead strategies menu shortcuts, backtracking and graphic design to show hierarchical orga-nization. Much progress could be made in this area with modest experimental efforts. An opportunity also exists to investigate software architectures for menunagement systems that dramatically reduce the amount of code while pe ng end users to develop and m

or own menus. Command languages. This tradi-tional style of interaction is another excele importance of consistency in syntactic format, congruent pairings of comm

HE COMPUTER revolution will be judged not by the complexity or power of technology but by the

service to human needs.

hierarchical structure, choice of famili nand names and parameters, suitab

pletion and interference from multi routes to accomplish the same task. The impact of response time and novel irdware display and entry devices on the

nmand set is another worthy topic in Direct manipulation. Visual inter-ces in which the user operates on a rep-sentation of the objects of interest are

resentation of the objects of interest are extremely attractive in computer-assist-ed design and manufacturing, video games, data base query, electronic spreadsheets, display editors and so on. Empirical studies would refine our under-standing of what is an appropriate analogical representation and the role of rapid, incremental, reversible operations. Hardware devices. The plethora of

keyboards, displays and pointing devices presents opportunities and challenges to system designers. The heated discussion about the relative merits of light pens touch screens, the mouse, voice input, function keys or high-resolution displays could be resolved through extensive ex-perimentation with multiple tasks and user communities. Underlying issues in-

user communities. Underlying issues in-clude speed, accuracy, fatigue, error cor-rection and subjective satisfaction. Response time, display rates and operator productivity. Many comput-or productivity. Many comput-or professionals believe in the sample prin-ciple that fatter is always better. Evi-dence from several IBM studies and other sources suggests that programmers are more productive when system response time is kept within the one-second range faster. On the other hand, isolated studies have shown that in some business decision-making tasks, computer-as instruction, complex order entry and in-troductory sessions with novices, rapid performance leads to poorer learning.

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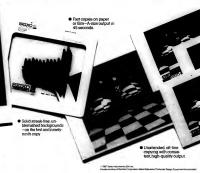
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s effective decisions, higher error rates doccasionally decreased satisfaction. A thorough study of multiple tasks A thorough stuny of tunuque tomes the awaited ower communities would need light on which situations would be approved with aborter response times or sater display rates. Understanding pro-logical issues of abort-term memory ad, decision-making strategies and in-runation overcload would help in prepar-g design guidelines for systems imple-

menters.

On-line seeistance. Although many systems offer help or tutorial information on-line, there is limited understanding of what constitutes effective design for novices, intermittent knowledgeable users and experts. The role of these aids and online user comultants could be studied to assess their impact on user success and attisfaction. The utility of a separate display or window for assistance or totorish should be contrasted with the common approach of entering a separate subsys-tem that displaces the current display of

tems are constructed with traditional protems are constructed with traditional pro-codural languages, but novel techniques could reduce implementation times by an order of magnitude. Specification lan-guages and dialogue-management sys-tems have been proposed, and some com-mercial packages are available. Advanced research on tools to aid interactive systems designers and implementers might have substantial payoff in reducing costs and improving quality.

Tools for developers:
Commercial systems managers, designcommercial systems managers, designcer and implementers are energing from
benign neglect of human engineering,
ordivare tools, design guidelines and neging techniques. New dislegue-emangement software packages provide support
for rapid prototyping and system development while admig design consistency and
simplifying evolutionary refisement.
Guideline decuments are being written
Guideline decuments are being written

Guideline documents are being written for general sudiences and for specific ap-plications. Many projects are taking the productive route of writing their own guidelines specifically tied to the prob-lems of their application environment. These guidelines are constructed from experimental results, experience with cut all systems and some knowledgeable total systems.

guesswork.

Pilot, iterative and acceptance testing
are appropriate during system development. Once the initial system is available,
refinements can be made on the basis of
on-line or printed surveys, individual or
group interviews or more controlled em-

roup interviews or more controlled em-rical tests of novel strategies. Feedback from users during the devel-ment process and for evolutionary re-mement can provide useful insights and adance. An on-line electronic mail faciligustance. An on-line electronic mail facili-try allows users to send comments directly to the designers. On-line user consultants and telephone hot-line workers can pro-vide not only prompt assistance but also much information about the activities and

computers that raising public conscious-ness may seem unnecessary. In fact, however, many people are uncomfortable with computers. When they do finally use a bank terminal or word processor, they

ANY PEOPLE are uncomfortable with computers. When they do finally use a bank terminal or word processor, they may be anxious about damaging the equipment, worried about feeling incompetent or threatened by the computer "being smarter than I am."

may be fearful of making mistakes, annious about damaging the equipment, worlded about feeling incompetent or threatened by the computer "being smarter than I am." These fears are generated, in part, by poor designs that have complex commands, hostile and vague error measures, fortusus and unfamiliar sequences.

of actions or a deceptive an

phic style.

One of my goals is to encourage users to translate their internal fears into action. Instead of feeling gulty when they get a message like SYNTAX ERROR, tion. Insteas or vecung gwar/ get a message like SYNTAX ERROR, they should express their anger at the system designer who was so inconsider-ate and thoughtless. Instead of feeling in-adequate or foolish because they cannot remember a complex sequence of com-mands, they should complain to the de-signer who did not provide a more conve-nient mechanism or should seek another As examples of successful and sat

na examples of successful and satisfy-ing systems become more visible, the crude designs will appear increasingly ar-chaic and become commercial failures. As designers improve interactive systems, some of these fears will recede, and the maintain experience of computer. ositive experience of competence, mas-rry and satisfaction will flow in. Then the image of computer scientists and data processing professionals will change in the public's view. The machine-oriented and technical image will give way to one of

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Application development gets a machine of its own

How one project moved out and found happiness on a VAX

BY DANIEL NOLAN

ost problems with application software or
cur when develop

plication software ecocur when development runs on the ame machine as production. Development and production are incompatible alllings, constantly fighting for resources and priority. The security that is indispensable for production proves to be an obstacle to devel-

> opment.
> Whenever production and development are placed on the same machine, production : the commercial operation — will always prevail over development.

A development project attempted on a machine that is running production tasks is handicapped from the start. Projects running into difficulty generally will not receive the attention they need to overcome problems until it becomes apparent that deadlines will be missed. The time needed to redirect development means that the necessary priority and resources will not arrive before the final

stages of testing.

By the time all of these difficulties are resolved, most of the problems the system will develpop are already incorporated in the design. From that point on, the system will behave like a petulant adult obsessed with the misfortune of being raised as a nesterated steepchild.

The advantage of a development machine — a machine that provides an environment allowing total concentration on the new system's problems without

Notan is an Amandale, Va. based computer scientist specialising in DBMS and fourth-generation languages.



interference from other work in progress — becomes evident when put to the test, as systems emerge faster, cleaner and with

The reason firms do not use development machines more often is not a technical one but rather a combination of politics

More quelity; less cost Corporate management, which is paying for development, would like the projects to be completed as soon as possible. It views purchasing a separate machine and justifying its expense as a tacit commitment to never-ending

as soon as possible. It views purchasing a separate machine and justifying its expense as a tacit commitment to never-ending development. While users may not actually come out and say they dislike programmers, they certainly wish the technicians would finish up so they can get some work done.

The diminishing price of machines has done much to dispel any economic objections. What we are now concentrating on is the more difficult issue: earning the confidence of developers by assuring them the machine will be used only to produce superior

When the large commercial IBM relational data base management systems became available in Digital Equipment Corp. VAX minicomputer versions, the opportunity presented itself to resolve this issue once and for all by giving development its

own machine.

Although the objective of moving development to a separate computer is to improve quality — which the development machine will do by magnitudes. — this move continues to

When the development machine is set up properly, it will no longer require the constant presence of attendants or technicans. In most cases, the onetime cost is approximately the same as the annual salary of a trained programmer; recurrent costs for every year thereafter can be measured in the cost of the electricity the machine con-

What follows is the story of how the first development machine—a computer set up for no other purpose than to serve new applications — was built.

Like many structures, the first development machine was put together in layers. First the plan, them the foundation, was alid, Walls went up next, and the

Dedicated hardware can decrease infighting

Develop IBM software on a VAX

· Quality-control solution: End-of-day reviews

ards and proce Like plumbing and heating systems in an office, these support systems made the development machine a comfortable and ve place to work

The effort began with the purchase of a DEC VAX-11/750 and Software AG of North America, Inc.'s Adabas and Natural relational DBMS for application developent. The overall cost of computer, peri-ierals, terminals and software was less han \$150,000 — today, a better site can ilt for a fraction of that amount. After all the pieces were assembled, iting the machine together and install ing the operating system took less than a week. The DBMS and language were add-ed on the last day. The next week, more san a quarter of a million lines of four

ECAUSE the VAX offers fewer memory and speed resources than the IBM, it is less able to tolerate inefficient code. Programs that happily ran on large IBM mainframes showed signs of disturbance on the VAX.

generation language source code, and 100 logical DBMS files were moved from the development side of the IBM to the VAX. began finding problems in programs that were known to be clean, chiefly in areas

associated with performance. Because the VAX offers fewer memory and speed resources than the IBM, it is less able to structed fro ratch on the VAX, test data was loade where necessary, and the programs were recompiled. Although recompilation was done primarily to avoid interface probtolerate inefficient code, and programs that happily ran on large IBM mainframes

showed signs of disturbance on the VAX.

A moral can be found in this: As compet-

creasingly difficult for errors to find places to hide.

Many of the IBM systems contained inefficient code routines that the larger machines had absorbed as part of their overhead. Enough inefficiencies congregating in an operating computer will cause degradation. Generally, such deg comes desperate. When the re ade to the VAX versions were sim rate. When the rep bed to the IBM, the larger machine reciprocated by magnifying the improve ments correspondingly, making the re-

lting system even more efficient By focusing the development tools that were built to support projects on the sys-tem, developers could examine thousands ers get smaller and faster, it becomes inof programs in minute detail. Patterns that indicated problems and inefficiencies quickly emerged, and standard ways of dealing with them could be applied. For ple, a program that read many records but updated only a few could be replaced with the more efficient "hydroplane" technique — stay above the data antil you see the records you want, then we like a pelican to undate those few

Keeping things aimple Setting up the larger IBM machines to run without constant monitoring is not a simple matter. From repeated experiences of spending months setting up ma-chines to run without attendance and turning them over to the customer, only to find they fell apart in a week, I am forced to admit that IBM's computers cannot run unattended when constructed according to the manufacturer's recom

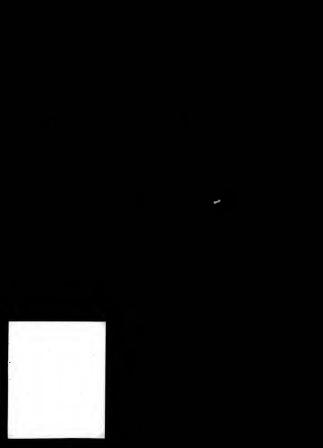
DEC, by contrast, designs its VAX computers so that they can be pretty much left to themselves. In keeping with the ideal that a well-running system needs little attention, the development system was set up with as few modifications to the initial version as possible. In addition, the developers, as well as other personnel who would be dealing with the machine, were trained in the rudiments of system programming. This ideal required that new software versions barely affect the system and could be rapidly installed without disrupting ongoing development

The only time anyone would be in the computer room was when there was a problem. For example, the VAX arrived with a sophisticated text editor that could be modified extensively to allow all manners of processing up to and including full word processing. However, the more modifications made to the text editor, the ore difficult installing new versio would be. Since the text editor was used by the word processor and new versions of the operating system would be installed by novices, the editor was not tailored. Security was handled in a similar way

Other than logging off the inactive termi-nals, the security of the VAX and data hase systems proved to be more than ade-quate. To avoid the logistical struggles of identifying and maintaining elaborate se-curity, access was provided for managers, developers and guests. Each new user was identified as belonging to one of these categories and invited to set up his own security within the implied limitations. No further precautions were taken; and the tem was never penetrated despite the eds of attempts, or wrong nu led during the year.

each developer's progra







as dilipently as if it were a navroll considerable skill at one method record and eased the task of re-constructing lost or damaged programs. Where the commerof changing tires, they had to learn the benefits of first stop-Before work began in the cial value in production is usually scribed in terms of records more liberal environment, the following basic guidelines had to

· Quality control and pro

the proper time.

they enter code

restrictions are critical, but en-

rement of these must occur at

o place must be passive. Con-ance checking can neither al-

ter programs nor interfere with

the work of programmers as

File generation and alteration

must be placed directly in the hands of developers in such a

way that changes are made safe-ly and without distracting people

• To limit program versions, li-

heary controls must be simple

create and delete programs as

the same time, all code must be

cted against inadverten

om the primary work of writing

the value on a development ma chine exists in its lines of code. Security was aimed at those outside the organization, and protection was controlled from ide. The developers worki on the machine wera profession-als in their own right, so few bar-

· Programmers cannot be expected to remember every stanrs were erected. ver, to ease the burde of housekeeping, account for work accomplished and make ed to examine every line of code every day.

certain that machine resources were well used, monitoring was done after the backups at night · Any automated method put and after the appropriate profes sionals were informed of the need for any software or hardware adjustments.

velopment philosophy rdware and software installs tion proved to be less of a critical sue than did programming pro

To get the most out of a de-velopment machine, developers needed a philosophy to replace the innate prejudices and limitations imposed during the two decades when development worked alongside production. Whara personnel had developed Sample screen: Quality control mail

ot" software inspects each progre see with standards. This review o s mail for the programmers.



 Programmers' egos should be considered. Any incentive for denying mistakes and conceali rors must be removed by mi The cost of recovery is in di-rect proportion to the deed. Ear-

ly detection minimizes costs. One person's misadventure should not inconvenience dos-

 The system should harbor no mysteries or hidden bugs; cause and effect should be directly as-Programmers must be able to machine on which they work can see errors and inefficiencies better and can shut down the sun-

Freed from tedlum Attempting development with out the proper tools is like trying to blow bubbles through a fork. The environmental needs of development in this installation were satisfied with the addition

tem, repeat and slow down th

of two pieces of supporting soft ware that would always be avail able to developers when needed. First, an on-line, menu-driven "developer's workbench" was built to allow operation of DBMS

own environments from defini tion to completion without assis ng skills. With the workbench, devel-

ners could create a file and provide a data dictionary from a sim-ple data definition language (DDL), both of which can ea be altered. In addition, specia uirements imposed by some lications could be simulated during testing: developers uses workbeach ontions to change terminal sessions, fourth-ge stion language parame

DBMS characteristics to match oduction equipment. To complement the work-bench, automiot routines were

installed to review all aspects of processing for a minuta, detailed the machine. Each night the soft ware did everything from com-paring DBMS file allocations to inspecting each program for compliance with standards. The computer monitored itself and

Developers were thus freed from much of the tedium of main-tenance so they could concentrate on a development project teams in more critical is Project work progressed with-out any of the delays that arise utilities to creata and after files. Developers could control their when technical operations must be performed by qualified

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es your DB2 database administrator have to spe ordinate amounts of time performing freque sks like:

- Detarmining which DB2 objects will be affected when an object is DROPed?
- when an object is DNOPed?

 Determining aristing DB2 object definitions, relationships, and security requirements?

 Moving DB2 objects from one status or systam to another (e.g. Tast to Production)?

 Creating physical sequential data sets containing data from multiplat DB2 tables?

 Propagating or Removing DB2 user security?
- and productivity, rather than work hours. Let tasks. It can:
 - Easily display DB2 object relationships at a
 - terminal Generate SQL CREATE and/or GRANT statements for a DB2 object and optionally some or AEL of its retated objects in a single operation Create a physical sequential data set with the
 - ratated objects in a bi Iting from any valld SQL SELECT
 - statement

 Generate SQL security statements to propagate/remove DB2 user security

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people. Developers could work freely, secure in the knowledge that they would not be bothered by the needs of the computer system or other projects. While all development team members were ware of and agreed to certain standards, oversights could not be eliminated. Each program still had to be reviewed for complance.

Quality control If this review were to occur during p

gramming, or too soon in the development process, it would probably mitude the experimentation needed to complete development. Consequently, allowing the fourth-generation language compiler to check for standards would not be accept-

able.

At the same time, a deferred review carries the risk of ending up with technically correct but impractical software that must be redone. This is usually discovered when there is not enough time to properly make repairs. Wairing until the acceptance-testing phase to check for complicions in the unaccentral.

A TTEMPTING development without the proper tools is like trying to blow bubbles through a fork.

The solution for this project was to treview work automatically at the end of each day. Quality control programs were installed to examine every program worked on that day. Precise quality control checks were generated from a number of sources, including proven standards, rules discovered during the first phase of construction and exceptions developed for specific sites.

This list ource exclude detecting differenced in statements that would work on some machines, such as the VAX, but not in IBM production environments. When such an anomaly was descreted, the workhench would send the code's author workhench would send the code's author pop up when the author next signed onto the terminal (see Chart page 5b). The autopilot program would abor provide line-by-line detail of any discrepancies

found. The messages continued to appear until the problem was resolved, either by correcting the program or by determining, via a valid-through, whether the sixproved to be an entrely new rule. If either of these two instances were the case, new rules were established, standards expanded and the checking programs modified to allow for the situation.

The program was not actually changed by quality control usuit. One of the first pulse testablished in enforcing standards was to never allow a change in the program without the author being present. Whether the change was made by another programmer or occurred automatically in the system, there would be hell to pay when any problem arises, even in the unlikely event that it was not caused by the

change.

The first versions of the quality control programs resulted in simple modifications to code, such as indenting and renaming variables. Because this distracted more than benefited developers, automatic alterations were confined mainly to resequencing line numbers and resolving

backward references to renumbered lines. These routines were moved to the wordbench, where they were used with increasingly less frequency as personnel became aware of the advantages of writting neat code at the outset.

In a production environment, utilities must be entrusted to a staff of specialists trained to analyze the problem and plan the solution in a series of safe steps. Data integrity and application utility must be protected at all costs.

Dangerous delays
The needs of development are directly
the reverse: There is no data to protect
and no utility until the development is
done. Therefore, any delay in resolving a
problem will popurative the entire project.

parameters or garbage in the data. Finding themselves caught between confronting a problem that needs immediate attention and the necessary utilities being protected by the National Guard, developers will invariably program "around" the problem. This tactic produces most of the computer errors that emerge in production. When the file or dictionary is finally corrected, the productions.

All problems manifest themselves as ogram errors, even when — or espe-

By when - the problems may have

nary, out-of-balance operating system

in produced by inaccurate file desc

ms, typographical errors in the data d

gram no longer works; the fix has become

iems at the source. To do this, they require the same level occurrio of the files and dictionary as they maintain with their code. Fourth-generation and DBMS languages, being far more powerful than older. Code. Forms and the like, require deflexibility in development files that data base administration specialists use when working with production files. And, since the development machine is so far removed from production, there is no rearted on development cannot be curranted to some one development cannot be curranted to some

In this particular instance, the critical roles of a separate data base administration staff were examined, and production restrictions were removed. Every

mont files

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1. For East Basemonian Programs A.S. Singston.

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developer could be trained in the fundamentals of the utilities. The developer's workbench let workers be self-sufficient when making changes to their files and

Some critical utilities were installed to protect the machine against contention and the errors that occur when someone yanks a file out from under a person just as that person is about to use it. The idea

was to allow the machine to protect itself. The utilities were built into a logical mu-driven format that corresponded to the phase of development the system was Utilities and special programs were ced in the appropriate category as either start-up, turnover, maintenance or review. Each selection after the initial screen was then followed by requests for details and further menus when neces-

Applications were well protected by backups, so developers could experiment freely. People were encouraged to first

HE CONSEQUENCE of total absence of control over program versions is mechanical

anarchy, Constant confusion will reign as to which program version is correct at any given time.

discuss changes among themselves and guard against making a change that would cause problems for others. If they chose not to cooperate, problems were resolved

by peer pressure.

The development machine experienced fewer incidents of programmers claiming that others changed their code than typically occurs at the more common sites that segregate application program-mers by project. Developers also obtained and gave assistance within broadly de-

and gave assistance within broadly de-fined areas of responsibility.

Along with these aspects, developers could monitor the effect of their work on the machine and other programs in the system to see where efficiency could be improved. Workbench utilities walked developers through steps that address

Each utility's screen provided full op-erational instructions. There were no shortcuts to any operation and no way to avoid seeing the screen repeatedly. This was done because these operations are serious, never to be performed casually.

In addition, the screens described any ages in the system or increas makey that may have been added since e last time it was used. No provision was made for streamlining the system func-tions. The workbench's operation was sporadic; when a file is finally correct, people stop modifying it.

Library controls Practically speaking, source code should never be permitted on a production ma-chine. The investment in data and depen-dence on the utilities' constant availability is sufficiently high to justify banning com-pilers from the production machine to

event misadventure.
On the other hand, the predom pment is code writing activity in development is code writer Typically, a single program is generat

against an entire logical file, which is part or all of one or more physical files, and is then changed to suit the requirements. Frequently, a change does not work, in which case the programmer needs to re turn to a previous version, assuming tha ming that

turn to a previ Since there is no limit on the number of program versions the machine will allow. ers typically maintain these versions using naming conventions and se-quences in an order that makes sense only

to themselves. Not only will someone walking unescorted into another programmer's development library not know where to begin, but he also will not be ab

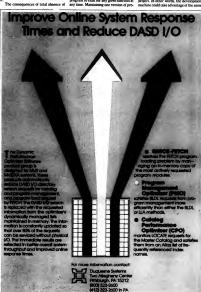
control over program versions is mechan-ical anarchy. Constant confusion will reign as to which program version is correct at any given time

me claim that info versions will be needed only in the event that the author wins the lottery and departs for sunnier climes, coun are wasted by developers trying to identify the most recent changes and authors working on wrong versions of their own ns. Rather than forcing the project to halt while the missing code is located, developers often attempt to reconstruct

it from scraps of paper and memory.
Whether a development or production. system, the best rule is to allow only one program to exist for any given function at grams protects the work more securely Losing time and risking error is unac-ceptable, particularly when one considers that the correct version is so near to hand.

On this development machine, the so-lution was provided with a workbench routine called Lazarus that allowed programmers to restore code from the prev ous day's status. Programmers could work securely with the assurance that the program could quickly be restored to its former state, dispelling any incentive for saturating a library with different ver-

es of the same program. Because the workbench was on a de velopment machine, changes could be made as rapidly as is required to support a project. In other words, the development



fits it gives a project. It could be changed to suit each project without the rd for performance or production. The final step in construction of the de nt machine was to train everyone wed with the machine to mount a ape and activate the Lazarus routine, ring the nightly operations. This removed bottlenecks caused when imple inenting features that eliminated con stant attendance and initiated protection.

Late at night, the Lazarus routine would check for active terminals. On find-ing none, it would quickly check the machine, files and programming code, back up the system and send messages on corections to designated people.

The development VAX provided de-elopers with further protection against

ELAXING production standards for development is not advocating anarchy. Like some "people's democracies," the development environment may, in the long run, prove to be a more difficult place to live in than the ordered bureaucracy of production.

ower failure. When power is restored, all work would be repeated automatically at minal; nothing important is lost.

The first development machine is now complete. Ongoing development work on new systems is continually under way. Data base administration and quality as nce staffs are relieved from the necessity of constantly monitoring details of

the system, and project management is simplified to make certain that schedules are reasonable and the work is effective. The finished product of a development

machine is a system that is fully operational on the production mad means that each piece of code, every pro cedure and all the files must be supported by and maintained in the production envi-

ronment. This is optimally done at the urce code level.

To ensure compatibility, systems are stantly shuttled back and forth between production and development in source form. Source DDL is used to establish the files and install the data dictio nary. Program source code is moved into

tance testing begins.

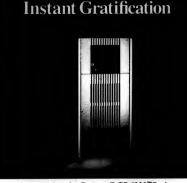
While installation of the develop machine will be slower the first time it is done, practice will make subsequent operations flow more smoothly. As with a good prototyping effort, the project should re-main fully staffed throughout final testing until the system has been installed and tuned for production work load.

Users considering a development in-stallation tend to voice many of the same stalled at their location. Through the experience of building the first development machine, they may find some answers to their questions as well as some precau-

The first installation may have been icult because there was no recipe to ollow and the outcome was uncertain, but subsequent development machines have been installed more easily. Much of the work that was done on the earliest versions of DBMS systems and attempts at very high-level languages have chniques that proved invaluable to one willing to go to the trouble of sifting through other discarded and obsessoftware to find them. Care must be taken to adhere to star

dards and quality. Relaxing production standards for development is not advocating anarchy. Like some "people's democthe development environment may, in the long run, prove to be a more difficult place to live in than the ordered bureaucracy of production.

Developers reveling in the respite om stiff-necked production rules cannot afford to forget that there will come a dgment day. Someday, installation will have to be done. Customers will want something to show for their money. If it cannot be delivered, the development ma ine will not have been justified, and everyone will have to return to the low-pririty mode of attempting to develop in the unused nooks and crannies of somebody else's commuter a



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MANAGEMENT



David Ludlum

Bourbon Street beat

The pervasive revelry of the last three days of Mardi Gras in New Orleans earlier this month provided a fitting backdrop for the seventh annual gathering of the Association for Computer Operations Managers (AFCOM). The tone of the con

ference organizers and many of the computer operations manag ers who attended the show was cidedly upbeat, if more sub dued than the carrying on of the costumed celebrants who paint ed Bourbon Street red that

For starters, the conference drew 700 attendees. That a not s big deal next to the annual mions of some larger computer management groups, but it marked continued, steady growth in AFCOM's turnout; 100 showed up for its first con-

rence in 1981 More to the point, the theme of this year's gathering was "New Responsibilities, Roles and Opportunities," and the operations managers on hand were clearly upbeat about the changes going on in their

Dialing for data on air freight

BY DAVID A. LUDLUM

Seeking to stay aloft in the increasingly information intensive delivery business, Emery Air Freight Corp. has forged a link to its customers with a system that lets its dial into a mainframe to track Emery shipments. Emery officials said their sys-

tem's direct-access dial-in service is the first in the air freight wide with a personal computer, communications software and

Any Emery customer worldpassword can reach the company with a telephone call via the Tymnet public data-network and ies, shipping rates and required documentation. The data can reportedly be printed or download



To provide added capab Emery sells customers a PC and software that allow them to com-

municate with the Emery host as well as print labels and shipping

Either way, customers as-

cally receive daily reports on their shipments called from Emery's mainframe, as well as send

and receive messages.

Emery must provide customers with such timely information on their shipments to keep abreast of competitors such as Federal Express Corp., accord-ing to John Pincavage, a securi-ties analyst with Painewebber Group, Inc. "It's something they ve to have to keep competitive with everyone else. If they don't

offer it and everybody else does, it's an obvious lack on their part," Pincavage said. Last year, Emery lost \$5.2 million on sales of \$888 million while Federal Express, which earned \$153 million on sales of

Continued on page 32

Feds form advisory DP panel

BY MITCH BETTS

WASHINGTON, D.C. - The federal government, a user orga-nization with a \$16 billion information systems budget, has entablished an expert advisory committee to help improve the

federal agencies.

The Office of Management and Budget (OMB) recently announced the formation of the OMB Information Technology Advisory Committee, which will include data processing manag ers from the private sector and

provide advice on how to solve DP problems shared by all users. Although many agencies have created advisory committees to obtain private-sector advice or technical subjects, this commit tee is believed to be the first with a governmentwide interest in

portunities for the productive application of information tech nology, the impediments to ef-fective use of technology and the remedies to mutual problems ex-

persenced by the federal government and the cor

AMR lands foreign reservation deal Reflects drive to reap computer service profits from travel agencies

BY DAVID A. LUDLUM

AMR Corp., parent company of American Airlines, has closed a deal to provide a fledging Euro-pean airline with computer services and has also forma launched a joint venture to offer servation services in Japan.
The moves reflect a drive by

AMR to resp computer service profits from foreign airlines and travel agencies. In the U.S., 90% of travel agencies already have computerized reservation sys-tems, according to company

spokesman Joe Stroop. "Quite honestly, the growth in the U.S. is going to be fairly limited," be said. Furthermore, rival reser-vation services offered by foreign airlines are less functional than those operated by Ameri can carriers, Stroop said. Last November, 21 European airlines agreed to sponsor a study of the feasibility of devel-

oping a joint reservations system and agreed not to make deals to use American carriers' systems The first phase of the study, which is being conducted by the New York consulting firm Simat, Heilsen and Eichner, will be presented to the European Airlines Association in Brussels on Fri-day, said Michael Friedman, a tant with the firm Earlier this month, AMR said it signed an agreement to pro-vide computer services to London-based Air Europe, which was isunched as a charter service in 1979 and currently pro-vides scheduled flights on three

 DPMA sets computer-crime guidelines. Page 95.
 Investigators' group bids for revival. Page 95. add service to seven European cities in the next year

Shell sleuths solve error mystery, save millions

BY JEFFRY BEELER

NAPA, Calif. - By launching a formal program to boost the quality of its services, Shell Oil Co.'s in-house computing group claims to have chopped the error rate for one of its crucial systems

by a factor of three. In so doing, the organization saved itself \$5 million in unnec-essary costs, according to Linda

essary costs, according to Linda Pierce, manager of quality im-provement in Shell'a Informa-tion & Computer Services unit. Roughly 70% of the savings resulted from the correction of ast one recurring problem — a ardware defect that kept a key hell system's downtime at unacceptably high levels.

Pierce, who spoke here recently during the Diebold Group,
Inc.'s 70th Plenary Meeting. credited the unit's cost reduc-tions partly to a fundamental shift in the organization's ap-proach to resolving bugs. In the past, members of the company's internal computing staff were

ally content to respond to tems gitches with little more than quick fixes.

Although the strategy pro-duced short-term payoffs, it created more problems in the long run than it solved, because it

treated only symptoms and not

flaw in some basic process or procedure. Left unremedied, a plagued a system in the past same problems or errors over and over again in the future,

So the Shell employees who signed the Information & emputer Services quality-imse analysis" as one of their ding principles, she added. In er words, they damped their ner quick-fix style of troubleoting in favor of an alternae method that stresses the imrtance of tracing problems to eir source and addression

Another practice that forms one of the quality-improvement effort's conceptual cornerstone is an increased emphasis on teaching end users the effective use of their analytical tools, or fication programs.

"Lack of training or ineffec-

tive training is very frequently a root cause of recurring syst problems," Pierce said. "Be-cause some of our clients have never been taught how their tools operate and how they all fit together, they often ina tently introduce errors as they struggle to use the programs

ago, the computing years ago.

program was never formally mandated by Shell's senior corporate executives. Instead, im-petus for the effort came entirely from within the Information A

Computer Services unit.
"We implemented a qualityimprovement process because we realized it would force us to do many of the things that need ed to be done if we were to continue providing cost-effective services," Pierce recalled.

"Some of the goals that we ope to achieve through our effort include moving closer to our clients, increasing our focus on defining specifications and re-ouirements and improving the ways we develop and support our systems," she stated.

Although the unit is seeking to raise the level of its services across the board, the organiza-Continued on page 94

The only way to stay milestones ahead is to leave the pack behind.

n any competitive arena, the quickest way to lose any advantage you may have gained is to relax. As soon as you do, you've lost your edge.

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standard: Novell's NetWare* LAN operating system software. It is a standard supported by nearly 500,000 NetWare users and 4,000 NetWare-compatible multiuser applications. A standard that gives users hardware independence, fault tolerance, and the ability to interconnect scores of separate LAN.

Now, with the announcement of the Universal Network Architecture (UNA) strategy, Novell has set forth yet another standard, another



milestone: using LAN technology to give PC users total computer connectivity. UNA will make it possible for computers of all kinds to seamlessly communicate and share data with each other.

At Novell, we're not content to be the LAN leader. So we're pushing ahead. Establishing NetWare LANs as a powerful, rost-effective alternative to minicomputer systems. Supporting NetWare users through unique efforts like the

NetWare Services Division, NetWare Centers International and NetWorld. And developing products that will make UNA and total connectivity a reality. In short, we're leaving the pack behind.

NOVELL.
Milestones Ahead.

Dialing

\$2.9 billion. According to an analyst who requested anonymity, Emery has lagged behind Federal Express and other rivals in the But Emery's new systems bring an advance — direct custion from the system regarding

er access to data. Federal Express' Supertracker system employs innovative hand-held ner-terminals that drivers scanner-terminals that drivers use to enter shipment data, which is relayed from trucks to headquarters by radio and leased lines. However, customers generally must talk to a Federal Express operator to get informa-

Foderal Express is conductcompany to deliver some of the
g experiments simed at outfile
medical instruments it ships.
With its mallow, Chab-Correminals and printers that
ming gets customized daily refederal Express equipment ing experiments aimed at outfitting customers with scanners terminals and printers that would provide direct exchange of shipment information, according to company spokeswo Shirlee Clark.

One Emery customer using a mailbox is Ciba-Corning Diag-nostics Corp. in Medfield, Mass., which employs the air freight

pervisor. Ciba-Corning also has the

With its mailbox, Ciba-Cor-ning gets customized daily re-ports that show the time pact-ages were delivered and who signed for them, allowing Ciba-Corning to check up on part or all of a day's shipment, gather data on rates and required documents and monitor Emery's perfor-mance, noted James Vaughn, Federal Express equipment for accessing data on shipments, but it only provides the time of deliv-ery, Vaughn added. Emery's ser-

ary, Vasultu ndded. Emery's service gives him all the data he needs and does not require "lably-witting," he said.

Emery developed its new system, which were the full operation in January time the full operation in January time to full operation in January time to full operation of the full operation operation of the full operation operati

five years ago, and required cus-tomers with a modem to directly dial one of six Emery concentra-

tors in the U.S.

Emery also helped pave the way for the new service when it began electronically transmit-



The enhancements for the tire ennancements for the present systems were developed in-house, requiring the better part of six-months, according to Robert Bohannon, Emery's vice-president of Information Sys-

The system is hosted by an IBM 3090 Model 180 main-frame at Emery headquarters in Wilton, Conn., which runs on MVS and is front-ended by IBM 3725 controllers with an X.25 interface. Emery's Systems Net-work Architecture employs a pair of 9.6K bit/sec. lines.

Data on about 10% of ship Data on about 10% of ship-ments is entered with diskettes provided by customers that have the PC systems supplied by Em-ery, Bohannon explained. The diskettes are picked up with shipments and flown to Dayton, Ohio, where the data is trans mitted to Wilton. Emery person-nel key in data on other ship-ments in Dayton.

The systems Emery supplies employ Relay Gold PC communi-cations software from VM Personal Computing in Danbury, Conn., which Emery recom-mends for customers who con-tact its mainframe using their own PCs.

on PCs.

One difficulty in deploying the stem was accommodating dif-rences in national packet-Bohannon pointed Continued on page 95



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MANAGEMENT

Bourbon Street CONTINUED FROM PAGE 89

As the evolution of technology has shaken up the data processing world, no where have the reverberations been more far-reaching than in the operations department. The advent of on-line prong, end-user computing and increasticated operating systems is ning data centers from production-ori ented facilities to service-oriented places, and that is changing the roles of

the operations manager and staff A principal impact on many operations departments has been a demand for managers and staff with both greater technical abilities and better people skills. That may not augur well for more inert

operations managers and workers and some would-be operations personnel. But the focus of those at the conference was on opportunities — new career paths and at least the hope of greater compensation, perhaps even a signifi-cant narrowing of the gap between the pay for programming and that accorded

to operations. On one hand, the technological ad-vances are whittling down operations de-partments' needs for data entry clerks, traditional operators and production-c

At the same time, however, some de-sertments have picked up the more skilled functions of systems and mai

skilled functions of systems and mainte-nance programizing from the other side of the organization chart. Some departments seek the same sort of skills to fill the new position of op-erations analyst, which has been spawned by the departments' growing amplexity. Some have taken on the compenty, some nave taken on managing similarly demanding roles of managing networks and staffing data center help desks. This last job emphasizes an addi-tional dimension. While the other new roles call for relatively sophisticated tec nical skills, manning the help desk de-mands strong people skills to help non-technical end users manage more of

The major lesson in this for those con-implating their role in operations is that her education has become increasing ly important. One bank operations man ager who attended the conference said the importance of higher education is already evident in job interviews at his de-

The operations manager's role
The role of the operations manager is
changing as well. In the past, he often
spent most of his day in the computer spent most or his day in the computer room, fighting fires with production jobs going on, in the words of AFCOM Presi-dent Leonard Eckhaus. Now he, too, is ore likely to be out of the computer room interacting with users and upper mething went wrong," Eck told the conference

told the conference.

Rather, he might discuss applications that are to be developed, work out service-level agreements with users or take a more active part in purchasing decisions. As with the staff, the new roles ean managers often need better train r, communications skills and education

ing, communications sauts any enumera-than they did in the past.

The managers also have battles to fight in capitalising on some of the gain their departments have already made. Just as the energy of the all-day Mardi

Gras celebration rapidly dissipated after the last parade on Tuesday evening, man agers at the conference grew restrained in their optimism when con idering bilities ha er their new res won their departments better compensa-tion — or even more recognition. When it comes to that, one said, the changes are not really being felt by the industry at

this time. this time.

The operations managers can only hope that they and their colleagues will win greater wages in light of their growing responsibilities before they gather for AFCOM's eighth annual conference a year from now in Las Vegas.

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AMR lands CONTINUED FROM PAGE 89

Through its AMR Inform tes subsidiary, AMR will provide Air Europe with computer services for reser-vations and ticketing and related accounting and reporting as well as proper loading

ing and reporting as wen as proper loading of freight and buggage.

The agreement is the first one for an American airline company to provide res-ervation services for a European airline in a multihost fashion, with the European sirline using the American company's central computer as the host for its own

The American companies currently rovide numerous carriers, foreign and

from the JES spool.

domestic, with more limited service that allows travelers to book flights on the air-lines through the companies' reservation

AMR provides multihost automation services to Pan American World Airways. Braniff, Transtar Airlines and Empire Air-

nes as well as the national carriers of costa Rica and El Salvador. It also is the leading supplier of rese vation systems to travel agents in the U.S. and the leading American supplier to

travel agents in Europe.

Last month, AMR Senior Vice-Presient Max Hopper visited Japan to formallaunch the company's previously an-

nced reservations joint venture with All Nippon Airways. Under the joint venture, the 1,700

travel agencies that use All Nippon's res-ervation system will be able to use the Sa-bre reservation system with the flip of a

"We've added 1.700 sales outlets to the distribution channel." Stroop said.

All Nippon is the largest domestic carrier in Japan and the fifth largest in the

world in terms of passengers boarded, Stroon said Last week, Hopper was in Europe pur-suing sales of Sabre services to travel agencies and airlines and seeking joint

entures with European carriers Allegis Corp., parent company of Unit-ed Air Lines, may soon announce deals with a European airline or airlines regarding use of its reservation system, accord ing to spokesman Mark Brand.

Shell sleuths

CONTINUED FROM PAGE 89

its quality-improvement programs affect the performance of one particular system. Pierce declined to discuss either the system's configuration or applications other than to characterize the system as a tool "sophisticated technical processing." In November 1984, when it first be

came a target for quality-improvement, the system was suffering a 33% "bomb rate," which was costing the firm an estimated \$12 million a year, Pierce said ms were forcing Shell's computing staff to interrupt and restart one of every three processing jobs the system un

Because of the system's critical impor-tance to Shell's business, Information & Computer Services personnel quickly seized upon it as a test of their new sess. In keeping with their ened awareness of rootysis, they scrutinized the tool's activities and identified 12 categories of problems that were contributing to its dismal per

One by one, the unit began attacking

ROBLEMS were forcing Shell's computing staff to restart one of every three processing jobs the system undertook

the problems in the order of their perceived priority. By far the most serie contributor to the system's many trou-bles was a recurring hardware bug that was periodically causing crashes.

Shell had long known of the defect but

had never insisted on pinpointing the gremin's origin. Whenever the system went down we'd simply call in a service technician, who'd tell us that the interruption was due to a had board and that he had re-

placed it." Pierce said. Through root-cause analysis, Shell racked the problem to a flawed production process at one of the vendors that es chips to the system's manufac-

turer. When these faults were removed, the board-related crashes vanished. The resulting rise in system availabil-ity has enabled the unit to reclaim \$3.5 ion worth of lost processor time

Since then, the Information & Com-ster Services team has applied the same tality-improvement techniques to some of the other items on its list of identified problems, including a few that reside in the system's software and application programs. Correction of the nonhardware errors added an additional \$1.5 million to

the group's overall cost savings.

Altogether, Shell's crusade for heightened quality has slashed the system's bomb rate from 33% to 10%, Pierce said. bomb rate from 33% to 10%, Pierce said.
"Our experiences thus far have been like losing weight," Pierce said. "The first 20 pounds are easy. The rest comes of only after tenacious persistence."

But while the hardest part of its work.

awaits, the unit intends to continue trying to upgrade its quality. In the probl that still afflict the system lies the potential for additional cost reductions estimat-ed at \$7 million.



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Information targeted as focus of computer crime

BY DAVID A. LUDLUM

PARK RIDGE, III. - The Data Processing Management Associ-ation (DPMA) has adopted a Model Computer Crime Act to be used as a guideline in the drafting of computer crime leads

The DPMA Executive Coun cil voted earlier this month to adopt a position statement that emphasizes the need for a special set of laws governing crimes re-

lated to information technology. ter hardware, while the model act stresses information

as the key resource vulnerable to se, theft or destruction. "We don't feel [legislators] should consider the computer as anything more than the weapon that is used," says Terry Felker,

the association's vice-president for public affairs.
The association will research nguter crime legislation to de

Dialing

termine which states might need to strengthen their laws, DPMA President Robert A. Hoadley ex-

ered computer crime in one way or another several have outdata

ed laws, says Richard Cashion, chairman of the DPMA Comput-Crime Committee. The model act stresses that ster crime laws should cover the following activities when they are unauthorized:

. Use or access of computer resources, including the computer and the information stored in it. · Release of computerized infor-

Copying or use of proprietary computer software and informa-

 Modification of computer re-sources including the computer, software and information. Denial of access to computer resources including the computer, computer software or infor-

ture as well as unrealistic to as-sess the financial return from the system because it is so key to the air freight business.

there are little nuances from country to country," he said. formation as doing the transpor-tation," he said, "As I've seen tation," he said. "As I've seen the business evolve over five years, more and more customers are requiring this kind of capabil-ity as a condition for doing busi-Another concern was adjusting parities for customers who use dumb terminals rather than

Developing security mea-ures for customers and Emery ness. They need pretty much instant access to information

Investigators' group bids for revival

corporate the International As-sociation of Computer Crime Investigators, which has been The association will be sime

at advancing the professional de-velopment and ethical conduct of computer crime investigators according to Jack Bologna, presi-dent of Computer Protection Systems, Inc. in Plymouth, Mich., and acting executive director of the association, who announced the bid to reincorpo-

Bologna said he envisions a global perspective and member-

the death of Bruce Goldstein, its founder and executive director, interest in the association has

nued to grow, Bologna said. "The association was moving slong rather well under Bruce's guidance. Unfortunately, none of the founding members we free to take on his responsibil-

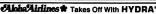
ities when be passed away."
He added, "I have been contacted by professionals in the fields of law, accounting, Jelectronic data processing), investigation and security and asked to organise an effort to professione computer crime investiga-

'The need for such expertise

tification nor ethical standard setting mechanism. With the de activation of the associati even the informal network we

had put together came apart. I believe the time is now ripe to reactivate." Bologna said.

members who pass a series of ex-aminations as Certified Computer Crime Investigators, Bologna said. He said the examination will cover such topics as er science, criminal justice, in vestigative and electronic DP audit procedures, the law of evi-dence, criminal statutes involved in computer crimes and the use of expert witnesses in high-tech





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DPMA backs bills for Section 1706 repeal

BY DAVID A. LUDLUM

PARK RIDGE, III. — The Data Processing Management Association (DPMA) has formally backed congressional bills to delay and repeal Section 1706 of the Tax Reform Act of 1986, which bars many computer consultants from working as in-

The DPMA has taken the stand partly half of members who work or who used to work as independent computer consultants, according to Terry Felker, who acts as the association's vice-presi-

dent for public affairs.

DPMA members who are data processing managers have not reported any
serious impact on their work from the
new tax law, says Felker, who is director
of the U.S. Army's Information Systems
Command in Fort Lee, Va. "We've heard nothing from any of the DP managers to indicate there's any concern on their.

work independently as subcontractors through a firm that acts as their broker or

It requires them to be treated as employees of the broker for tax purposes, a less advantageous status than indepennew anyamageous status than independent contractor, unless they can demonstrate on the basis of 20 common-law standards that they truly function as independent businesses with broad control over how they do their work.

Tex disordventege
Section 1706 applies to certain technical service workers, including computer consultants, programmers and analysts, who prefersions., "a DPMA statement says.

DPMA President Robert Hoodley, data processing director for the city of Ra-leigh, N.C., says the association's position

Delaying Section 1706
"These targeted technical service workers were not granted the opportunity to give input before the decision was made," likeflar are.

According to Felker, "Delaying the implementation of Section 1706 is the least Congress should do

"Congress can then hear from the computer industry and the Internal Reve-nue Service and determine if Section 1706 should be implemented." Felker



66th ADAPSO Management Con-ference, Orlando, Fla., March 29-April 1 — Contact: Christopher Carleton, ADAPSO, Suite 300, 1300 North 17th St., Arlington, Va. 22209.

EFTA Expo. Las Vegas, March 29-April 1 — Contact: Kristi Gasaway, Elecconact: Kristi Gasaway, Electronic Funds Transfer Association, Suite 1000, 1726 M St. N.W., Washington, D.C. 20036.

The Inevitable Partnership: Lead-ers Achieving Business Goals Through Technology. New Orleans, March 29-April 1 — Contact: Life Office Management Association, 5770 Powers Ferry Road, Atlanta, Ga. 30327.

Management Information Systems for Strategic Advantage. Philadel-phia, March 29-April 3 — Contact: Regisprisi, Marcin 29-April 3 — Contact: Regis-trar, Office of Executive Education, 200 Vance Hall, The Wharton School, Univer-sity of Pennsylvania, Philadelphia, Pa. 19104. Also being held Sept. 20-25 in

Interface '87. Las Vegas. March 30-April 2 — Contact: The Interface Group, Inc., 300 First Are., Needham, Mass. 02194.

1987 National Conference on Data Processing Quality Assurance. Chi-cago, April 1-3 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orndo, Fla. 32819

1987 Computer Dealers & Lessors Association Spring Meeting. Orlan-do, Fla., April 1-4 — Contact: Computer Dealers & Lessors Association, Inc., 1212 Potomac St. N.W., Washington,

Networking: The Large Organiza-tion Perspective. Melbourne, Fla., April 2-3 — Contact: Harris Briefing Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

APRIL 5-11

Human Factors in Computing Sys-tems & Graphics Interface 1987. Toronto, April 5-9 — Contact: Wendy Walker, CHI & GI '87 Conference Office, Computer Systems Research Institute, University of Toronto, 2002-10 Kings



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College Road, Toronto, Ont., Canada MSS 1A4. Conferences. Oriando, Fla., April 6-9 — Contact: The Society For Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

> Conference and Expe April 6-9, Detroit — C Engineering Society of Detroit, 100 Farnsworth Ave., Detroit, Mich. 48202.

The Comten Uners' Ex-change Spring Conference. Washington, D.C., April 6-10 —

Contact: Dave Beran, NCR Comten, 2700 Snelling Ave. N., St. Paul, Minn. 55113.

Fourth Annual International Conference on Technology and Education. For Worth, Texas, April 7-9 — Contact: Jimmie Thompson, ICTE, 1400 One Tandy Center, Fort Worth, Texas 76102.

New Directions in Informa-tion Management. New York, April 8-9 — Contact: The Con-ference Board, 845 Third Ave., New York, N.Y. 10022.

Trends in Technology for Education and Industry, St. Paul, Minn., April 8-9 — Con-tact: Combase, Inc., Suite 890, 333 Sibley St., St. Paul, Minn.

California Educational Computing Consortium. San Jose, Calif., April 9-10 — Con-tact: Alexia Devlin, NADM-358, Accounting Data, San Francisco State University, 1600 Holloway Ave., San Francisco,

Satellite Communications Status '87: Technology, Ap-Sixth Annual Conference on plications & Ma

York, April 9-10 - Contact: Susan Smith, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

APRIL 12-18

COACH Conference XII. To COACH Conference Ass. 10-ronto, April 12-15 — Contact: The Canadian Organization for Advancement of Computers in Health, No. 1200, 10460 May-field Road, Edmonton, Alta.,

Long Range Information Systems Planning. Atlanta and San Francisco, April 13-16

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Commercial Crime Conference. Hong Kong, April 13-17

— Contact: Nelson P. C. Tse, Computer Services, Hong Kong Productivity Council. 12-b. Productivity Council, 12th Ploor, World Commerce Centre, 11 Canton Road, Tsimshatsui, Kowloon, Hong Kong.

April 14-16 — Contact: Data ocessing Management Associ-on, Atlanta Chapter, P.O. Box 34, Atlanta, Ga. 30301.

Optica '87 (First Interna-tional Meeting for Optical Publishing and Storage). Amsterdam, April 14-16 — Contact: Jean Mulligan, Learned Hinksey Hill, Oxford, England OX15AU.

APRIL 19-25

The National Information Management Users Confer-ence. Dallas, April 21-22 — Contact: Eastern regions: Jan O. Ward, Quality Information Con-sultants, Inc., 11204 Augus Place, Potomac, Md. 20854. Western regions: Ann K. Ander-

son & Associates, P.O. Box 4157, Foster City, Calif. 94404. April 22-24 — Contact: Tower Conference Management Co., DEC Review: The Digital 31 W. Wesley St., Wheaton, III.

DEC Review: The Digital Challenge. Cambridge, Mass., April 21-22 — Contact: Diane Scretter, International Data Corp., 5 Speen St., Framingham, 999 01701

Standards: The Ties That Bind. New York, April 22-23 — Contact: The Yankee Group, 200 Portland St., Boston, Mass. 02114.

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ta Blvd., Corte Madera, Calif. 94925

pan 107. The Branch of the Future, The Future of the Branch. Dallas, April 27-29 — Contact: Bankers Institute, 21 Tamal Vis-

Speech Tech '87. New York, April 28-30 — Contact: Margo Kelly, Media Dimensions, Inc., 42 E. 23rd St., New York, N.Y. 10010

IBX Users Group Associa-tion 12th Meeting, Irvine, Calif., April 29-May 1 — Con-tact: Elizabeth Stockwell, Wang tems Management Annual Conference. Louisville, Ky., April 26-29 — Contact: Richard B. McCaffrey, ASM, 24587 Bag-Laboratories, Inc., Mail Stop 013-038, One Industrial Ave., ley Road, Cleveland, Ohio 44138. Lowell, Mass. 01851

Corpcon. Chicago, April 28-30 — Contact: Linds Morris, Corp-con, P.O. Box 3727, Santa Moni-ca, Calif. 90403. Also being held Sept. 21-23 in Los Angeles.

National Workshop & Com-puter Systems Demonstra-tions. Kansas City. Mo., April 26-29 — Contact: Management Systems Committee, American Trucking Associations, 2200 Dexpo South '87. Nashville, April 28-30 — Contact: Expo-consal International, Inc., 3 In-dependence, Way. Princeton, N.J. 08540. Cinteract '87. San Diego, April 26-30 — Contact: Cincom Systems, 2300' Montana Ave., Cincinnati, Ohio 45211.

BMC Software User Group's Second Annual Meeting. Houston, April 29-May 1 — Expo Bank Asia 87 Conference. Osaka, Japan, April 27-28
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19th Annual International Management Information Systems Conference. Cam-bridge, Mass., April 29-May 1 — Contact: Paper Industry

Management Association, 2400 E. Oakton St., Arlington Heights, Ill. 60005.

MAY 3-9

1987 Association for Infor-mation and Image Manage-ment Show. New York, April 27-30 — AIIM, Suite 1100, 1100 Wayne Ave., Silver Spring. AUUA (Sperry Uners) Spring Conference. Orlando, Fla., May 3-7 — Contact: Randal L. Leonard, Gay & Taylor, Inc.,

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Eighth Annual Meeting of the Inter-national Association of Synercom Users. Houston, May 3-7 - Contact: Gary Carson, Synercom, 10405 Co rate Drive, Sugar Land, Texas 77478 m, 10405 Corpo

nputing and First World nputer Exhibition. Santa Supercomputer Exhibition. Santa Clara, Calif., May 3-8 — Contact: Lana Kartashev, Dynamic Computer Architec-ture, Inc., Suite B-309, 3000 34th St. S.,

St. Petersburg, Fla. 33711. Computers & Communications in the Healthcare Industry. Dallas, May 4-5 — Contact: Carol Every, Frost & Sulivan, Inc., 106 Fulton St., New York,

Eastern Communications Forum 87. Stamford, Conn., May 4-6 — Con-tact: ECF, 505 N. Lake Shore Drive, Chi-

BankAI. Brussels, May 5-6 - Contact: Society for Worldwide Interbank Finan-cial Telecommunications, AI Business Unit, Avenue E. Solvay 81, 1310 La Hulpe, Belgium.

Eighth National Online Meeting. New York, May 5-7 — Contact: Learned Information, Inc., 143 Old Mariton Pike, Medford, N.J. 08055.

18th Annual Meeting of the AS1 Us-ers' Group. New Orleans, May 5-8 — Contact: University of Michigan, Data Systems Center, 2021 Administrative Services Building, Ann Arbor, Mich

Second International Optical Stor-age Forum. Denver, May 6-8 — Con-tact: Cartlidge & Associates, Inc., Suite M259, 1101 S. Winchester Blvd., San lose, Calif. 95128

1987 International Conference & Exhibition on Health Industry Bar Coding. Atlanta, May 6-8 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa 15238

MAY 10-16

APL87. Dallas, May 10-14 — Contact: APL87 Registrar, Suite 210, 440 North-lake Shopping Center, Dallas, Texas

VIP '87 — Duquesne Systems In-ternational Users Group, Chicago, May 11-12 — Contact: Donna Bartko, Duquesne Systems, Inc., Two Alleghens Center, Pittsburgh, Pa. 15212.

Audit Managers' Symposium IX. Hil-ton Head Island, S.C., May 11-13 — Con-tact: Jane Evans, MIS Training Institute, 4 Brewster Road, Framingham, Mass.

CD-1/The Future Conference. San Francisco, May 11-13 — Contact: Carol

Peters, Online International, Inc., 989 Avenue of the Americas, New York, N.Y. 10018. wig-Erhard-Anlage 1, POB 97 01 26, D-6000, Frankfurt 97, West Germany

Desktop Publishing '87. San Francis-co, May 11-13 — Contact: Carol Peters, Online International, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

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Infobase '87 — International Data-base Exhibition and Congress. Frankfurt, West Germany, May 12-14 — Contact: Messe Frankfurt GmhH, Lud-

Network Users Association Spring Meeting. Atlanta, May 13-15 — Contact: Network Users Association, Suite 400, 2111 Eisenhower Ave., Alexandria.

Federal Conference on Electronic Publishing, Bethesda, Md., May 13-15 - Contact: Calmers Exposition Group. P.O. Box 3833, 999 Summer St., Stamford Corp. 06905

Eighth Annual Computer Law Insti-tute. Los Angeles, May 14-15 — Con-Eighth Ar tact: University of Southern California Law Center, University Park, Los Ange

les Calif. 90007.

Infoweek '87. May 17-20, Dallas -Contact: UCCEL, Marketing Communi cations c/o Financial Systems Division P.O. Box 660054, Dallas, Texas 75266.

International Communications As-sociation 1987 Conference & Exposition. New Orleans, May 17-22 - Contact: ICA, Suite 710, LB-89, 12750 Merit Drive, Dallas, Texas 75251

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COMPUTER INDUSTRY

INDUSTRY INSIGHT



Exporting? Ask the Feds

OK, so you've got the best new computer product since the mouse and you want to exp your markets beyond the U.S. borders. That makes you an exter, but bow do you go about

Believe it or not, you need help from Uncle Sam. Start with the newly updated "A Basic Guide To Export-ing," published by the Departerce and available

from your local Government ng Office (GPO) outlet for \$8.50. This guide explains the numerous government pro-grams devoted to beloing U.S.

The scope of services pro vided by the Commerce Department is vast and yet often overlocked by many businesses. There are trade missions, trade ws, seminars and counseling vices. Exhibitors at last services. Exhibitors at last year's National Computer C ference (NCC) rated the department's Foreign Buyer Program as "the best new aspect of NCC for 1986." and it will be re-

ted this year at NCC and Comdex/Fall '87. Lest you fear that this will re a lot of red tape, be advised that you can get one-stop no for these services at of es of the U.S. and Foreign

al Service, which located in most major cities Next, subscribe to the Com erce Department's mo magazine for international trade, called Business America. It costs \$57 a year from the

This is not the prettiest magazine in the world, our the most objective. But if you read between the lines, there is a lot of foreign market intelligence to be had. A careful reader will find prospects for direct sales, joint ventures and marketing

The department gets its in-formation from cables sent to gton, D.C., by a net work of trade officials in U.S. ssies and U.S. and For-Continued on page 109

Fujitsu, Fairchild nix buy-out

Firms claim technical swap, distribution partnership will continue

BY JAMES A. MARTIN

Although the controversial acion of Fairchild Semiron ductor Corp. by Japanese giant Fujitsu Ltd. has been canceled by mutual agreement, the two

to continue their partnership in several strategic areas.
"There won't be any equity involved now, but otherwise, the agreement is still pretty much the same," Donald W. Brooks,

Fairchild's president and chief executive officer, said last week. In a surprise an early last week, Schlumberger Ltd., the French owner of Silicon

Valley semiconductor pioneer Fairchild, and Fujitsu jointly stated they would bow to U.S. gov-ernment and industry pressure and scrap plans for Fujitsu to buy Fairchild. The acquistion was first announced last fall [CW,

the rising political controversy in the U.S. regarding the joint venture made it unlikely that the buy-out of Fairchild could be completed in a reasonable up.

"We feel it is deplorable to be

forced by government interven-tion to withdraw from the joint venture," said Fujitsu President would cost between \$200 million and \$400 million, analysts said.

Such a buy-out might requ Fairchild to seek outside capital investment in the form of a pulshe offering. Brooks said, but no cifics have been planned.

Fairchild, once an industry leader and the first major Silicon Valley semiconductor company has continued to lose money in table industry. As a result, Fairchild will find it hard to con Continued on page 104

Data View IBM: A long road back



E.F. HUTTON & CO.

BY ELISABETH HORWITT

MALVERN, Pa. - Planning to target the burgeoning enter-prise networking market, comsications vendors Rabbit Software Corp. and Micro Plus II, Inc. announced last week that they have entered an agreement

in principle to merge.

Under the terms of the sgree-ment, Boca Raton, Fla-based Micro Plus would become Rabbit's subsidiary, and the two companies would jointly market "complete networking solutions to Fortune 1,000 companies and OEMs," according to Charles Robbins, Rabbit senior vice-president of development.

Networkers merge, eye user markets Rabbit specializes in software networking of applications,"

cts connecting multitasking and multiuser microcomput-ers and IBM mainframes using IBM communications protocols such as LU6.2 and Document Interchange Architecture. Micro Plus's hardware offerings link IBM Personal Computers with IBM's Systems Network Archi-

will continue with their plans to

join forces in all other areas, in-

cluding technology exchange, second-sourcing and foundry

agreements. In theory, Fairchild

would benefit from Fujitsu's

vanced memory chip technol-ogy, white Fujitsu would gain ac-cess to Fairchild's U.S.

distribution system as well as its

is exploring the possibility of a le-veraged buy-out from Schlum-berger, which is not expected to

maintain financial interest in Fairchild. The buy-out proposal

h-speed logic chips. Fairchild's, ton muna

mulacturing savvy and ad-

tecture and bisynchronous envi-ronments, as well as with X.25compatible packet-switching

product strategy will be to add value to IBM and industry stan-dard Open Systems Interconnect communications protocols and to "help the chief informa-

ins explanted. The two companies said they also hope to combine Rabbit's OEM connections with max frame companies such as IBM and Unisys Corp. with Micro Plus's OEM and large end-user

er, Micro Plus shareholders will receive approximately two miltion shares of Rabbit common stock, according to company offi-

Financial details of the merger were not disclosed at the time of the announcement A tentative compl or the merger is set for May. In 1983. Hewlett-Packard

Smaller drives bound for glory

Analysts say 31/2-in. disks will sell twice as much as larger floppies by '90

BY JAMES A. MARTIN

Although sales in the 31/1-in, mi-crofloppy disk drive industry are today mainly confined to a few desktop microcomputer and sev-eral laptop vendors, analysts ors, analysts predict that by the early 1990s the smaller storage medium will sell twice as much as its pred cessor, the now-standard 516-in

The 31/1-in. microfloppy disk will absolutely be the data-transfer medium of choice as we get further into the decade," says Phil Devin, nenior data stora analyst for Dataquest, Inc. in S

Jose, Calif. The 3½-in. floppy disk drive industry stands to gain its great-est momentum when IBM begas phasing in the microfloppy as a standard for its future Pe sonal Computer family mem-bers. Exactly when that will hap-

pen, however, remains a mystery to everyone but IBM. Last year, IBM unveiled its PC Convertible laptop using the aller disk size and announced on internal 3Wain microflooms sk drive as an option for the PC XT Model 286. Analysts predict that IBM will unveil on April 2 an Intel Corp. 8086-based PC armed at the education market that will have at least one standard 31/-in. microfloppy. Two advanced PC ATs are expected to have the smaller floppy drive

Boom around corner Regardless of when IBM be-stows the 3½-in. floppy-disk technology with standard status. the small disk drive industry is preparing for a boom. The majority of companies manufactur-ing 3½-in. diskette drives are Japanese, with Sony Corp. in the lead followed by such competi-tors as NEC Information Systems, Inc. and Mitsubishi ElecCo introduced its HP 150 microcomputer using a 3½-in. floppy disk drive, considered to be an ustry first. Worldwide per unit shipments that year of 31/2in. drives were 107,000, according to Dataquest. A year later. Apple Computer, Inc.'s Macintosh debuted using the smaller size disks; 272,000 units were ed that year

Sales have continued to escalate in this rapidly expanding industry. In 1986, 890,000 314-in floppy units were slupped, with 2 million expected this year, 4 mil-tion in 1988 and 8 million in

in florey disk drives are expected to begin declining by 1988. In 1986, Dataquest estimates, 10

Continued on page 106

Fujitsu

FROM PAGE 103 up the funds, according to sel Kubiak, a semiconduc-salvst with Kidder, Peabody ing to sell them now at a time n they've invested so much

Even though Fujitsu will not un 80% of Fairchild, as originally planned, the alliance will continue to be scrutinized by the

nent and competitors rooks, however, said the re-nahip was no different from earlier-announced partnerships between American-based Mo-torols, Inc. and Toshiba Corp.

Sematech unaffected The cancellation to acquire Fairchild should not have any direct searing no the future of Semactor companies recently announced to help protect the U.S. industry against competitive pressures from overseas. Brooks said. He added that Fair child has no plans to join

Mini modem rights bought

BY CLINTON WILDER and ALAN J. RYAN

SUFFERN, N.Y. - Apparently ing aim at Migent Software, Inc. and other vendors of com-pact modems, Rapitech Sys-tems, Inc., based here, recently lared it has acquired all rights the basic patent for what is called the pocket modern Rapitech, heretofore a ven-

dor of Fortran-to-C and Cobolto-C conversion tools, acquired Randy Brandt, a data communi Calif, Rapitech has no produ yet but will be contacting Migent in Incline Village, Nev., and oth-er vendors about possible licensing agreements, according to Larry Woodruff, Rapitech's vicesent of marketing

Rapitech stated that it now ens exclusive rights to license and build the cigarette pack-size modern, which plugs into an RS-232 serial port. "Rapitech is prepared to license its technology so that modem manufacturers can old subsequent bigation," a

But Migent, which has been building a pocket modern of its own since late last year, claimed that its modern is very differe from the pocket modem develed by Brandt

Independent systems design-er Ken Krechmer of Palo Alto, Calif., who designed the modem for Migent, said he does not believe Migent's modern is in con-flict with the Rapitech modern. Raminech disagreed

Schlumberger is preparing to andon Fairchild at the point that its subsidiary is on the verge "It's too had Schlumberger is

some of that investment,

added. Thomsen said the semiconductor industry is making a nid comeback this year from hich Fairchild will benefit. Because Fairchild is a major vendor of bipolar gate-array technology used in classified high-speed military weapons.

increasingly concerned that the id leave the U.S. vulble to foreign forces for

strategic technology. Most re-cently, Secretary of Commerce Malcom Baldrige and Secretary of Defense Caspar Weinberger called for a Cabinet-level review

of the pending acquisition.

If Fujitsu had approached Fairchild two years ago, there would have been much less opposition, analysts said. Recent heated exchanges between Ja-nan and the U.S. regarding the

1986 anti-chip dumping trad accords, along with weakene U.S. semiconductor compa and the strength of the yen, have escalated fears that Japan will gain an ever-greater lead in the chip industry at America's expense. "In business, timing is everything, and the Fairchild-Fujitsu announcement was poorly timed " Kidder, Peahody's Ku-



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NICKELS & DIMES

American Management Sys-tems, Inc. announced revenue for the year ended Dec. 31 of \$135.5 million, compared with \$112.2 million in the previous year. Profits were \$5.2 million or \$1.02 per share, complored with \$5 million, or 74 cents per share, in the year-ago period.

Fourth-quarter revenue was \$37.1 million, compared with \$31.6 million a year ago. Profits were \$1.7 million, compared

quarter ended Jan. 24 of \$33.7 million, compared with \$39.6 million a year ago. Profits were \$435,000, compared with \$5 million, or 28 cents per share, in

were \$1.7 million, compared with \$1.4 million in the previous year.

Novell, Inc. reported revenue for the first quarter ended Jan. 31 of \$2.99 million, compared million compared million year ago. Profits were \$3.5 million a year ago. Profits were \$3.5 million a year ago. Profits were \$3.5 million, or 31

cents per share, compared with \$2.1 million, or 20 cents per share, in the year-ago period. ELXSI Ltd. announce

American Software, Inc. reported revenue for the third quarter ended Jan. 31 of \$13.1 million, compared with \$8.9 mil lion in the previous year. Profits were \$2.9 million, or 42 cents per share, compared with 1.3 million, or 19 cents per share, in

ELXSI Ltd. announced rev nue for the fourth quarter of \$4.1 million, compared with \$8 million in the previous year. Net loss was \$2.9 million, or 4 cents per share, compared with a net loss of \$19.9 million, or 34 cents per share, in the like period a

year ago. Revenue for the year was \$22.4 million, compared with \$28.6 million a year earlier.

Pansophic Systems, Inc. announced net income for the third quarter ended Jan. 31 of \$6.2 million, or 70 cents per share, on revenue of \$34.6 million. This pares with net income of \$4.9 million, or 56 cents per share, on revenue of \$25.1 milion in the previous year.

Televideo Systems, Inc. reported revenue for the first quarter ended Jan. 30 of \$23.8 million, compared with \$22.3

million in the previous year. Profits were \$400,000, or 1 cent per share, compared with \$300,000, or 1 cent per share, in the like period a year ago.

Mohawk Data Sciences Corp. reported net income for the third quarter ended Jan. 31 of \$1.9 million, or 12 cents per share, compared with a loss of \$5 million, or 33 cents per share, for the like period last year. Rev-enue for the third quarter was \$22.1 million, compared with \$51.2 million for the third quar-

Floating Point Systems, Inc. reported revenue for the first quarter ended Jan. 31 of \$24.3 million, compared with \$26.5 million in the previous year. Profits were \$203,000, or 2 cents per share, compared with \$1.3 million, or 15 cents per share, in the year-ago quarter.

Telex Corp. annou oue for the third guarter ended Dec. 31 of \$212.5 million, compared with \$176.5 million a year ago. Profits were \$18.3 million, or \$1.24 per share, compared with \$15.8 million, or \$1.21 per share, a year ago.

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Smaller drives FROM PAGE 103

shipped worldwide, a figure that will be increasing to 11 million was no increasing to 11 million this year, dropping to 10 million in 1988 and to 8.4 million in 1990. By 1991, abipments of 3½-in. Boppy drives are antici-pated to be 14 million, twice the 7.3 million expected for 5¼-in.

The 31/2-in, hard disk drive industry is expecting a boom as well. With the advent of laptops offering hard disks and the deds from users for smaller of 31/1-in. hard drives are expect-ed to reach \$1 billion this year and to double in size every year through the end of the decade, according to Andrew Neff, a storage analyst with Montgom y Securities in San Francisco.

Within the 31/2-in. hard diskdrive industry, there are a num ber of American companies that stand to gain from the expected tum for that stor-

Shipments to double The recently amounced Com-paq Computer Corp. Portable III, for example, features a 3½-in, hard disk from Conner Peri-

pany specializing in the smaller Winchester drives. Conner Peri-pherals is shipping some 3,000 hard disks per day and says it ex-pects to double that amount within six months.

Miniscribe Corp. in Long-mont, Colo., the industry leader in 31/4-in. hard disk drives, says it is anticipating exponential growth. In 1986, revenue from the company's 3½-in. hard disk drives totaled \$51.9 million; rev-enue is expected to reach \$112

million this year. By the fourth quarter, sales of Miniscribe's 314-in. hard disk drives should contribute 50% of the firm's annual revenue, matched by the sales of 5%-in, drives. With the shrinking we're ex pecting in the 5%-in. hard diskdrive market, those vendors who want to continue are going to have to offer 31/2-in. disks as well," says Bob Katzive, vice-president of Disk/Trend. Inc., a well."

consulting firm that publishes an Several hard disk drive man facturers have announced plans to enter the downsized market. Seagate Technology, the leading 5%-in. hard disk manufacturer, ity of the 5%-in, disks, analysts says it is coming out with six 3½-in. hard disk drives for low- to high-end performance. A spokesman for Maxtor Corp.,

another leading Winchester disk drive company, says his firm will unce plans for the mic sk drive sometime this year The main obstacle to wide spread acceptance by OEM ven-dors of the 3%-in, hard disk drive

industry is performance. At this st, most of the smaller hard sks do not quite hold the cap

most software companies are trying to keep their costs as low as possible. They're going to re-sist distributing software on that medium, at least for the time bedies to jump, however. One problem is the large number of 5%-in. floppy disk-based PCs that exist already. Few corpora tions and businesses will aban don their current PCs in favor of ing, but they'll eventually come a new generation just to take ad vantage of smaller disk technol

Microsoft Corp.'s Microsoft Word, Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dosse III are a few of the pro-grams available today, most of In addition, the amount of

which were announced in con-junction with IBM's PC Convert-

Hedging bets More recently, Computer Asso-ciates International, Inc. ascrocomputer software, such as percalc 4, on both formats.

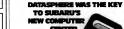
In the long run, 31/2-in. stor age media is not going to be the last word. Dataquest predicts that 3½-in. floppy disk drives will peak around 1992 and will begin to lose ground afterward to the integrated-circuit card. roughly the size of a credit card, which contains memory chips for PROVIDED BY DATAGERST, INC.

storage purposes. software currently available on The integrated-circuit ca has its origins in automated tell-er machine cards used by many financial institutions today. Pan-asonic Industrial Co. and NEC Corp. are reported to be develooing this technology.

Conflicting standards

say. They predict, however, that the micro hard disk drive technology will significantly improve within the next few years. The 31/2-in, floppy disk drive

31/s-in. microfloppy format is mi-nor. "There's no real mass distribution of software other than that for the Macintosh," Devin says. "The medium is more exindustry still has a few more hurpensive than the 5%-in., and



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Students quiz entrepreneurs at show

BY DONNA RAIMONDI

CHICAGO - The halls of the Marriott Hotel resounded with hearty greetings, sincere congratulations and a multitude of usiness questions, such as the following:
"What did it feel like to take down your

 "How do you hire good people when you are growing so fast?"

"What kind of a computer can keep up with such rapid growth?"

Strange questions from a group of colents. But the questions were directed at successful businessmen who not too long ago were themselves students and many of whom are involved in com-

It was the recent fourth annual inter-national convention of the Association of Collegiste Entrepreneurs (ACE). The students hanging out in the whiripool looked like any other college-age people, but they did not sound the same. The focus here was on business problems — specifically, on the management of multi-million dollar businesses, many of them computer-related, that grew from nothing to millions of dollars in revenue in a short period of time, sometimes months. The top 100 entrepreneurs chosen at the convention were responsible for more than \$4 billion in revenues in 1986.

Growth Isn't everything
"Entrepreneurs shouldn't be sucked in by
the mentality that says growth is everyting," advised Michael Brown, founder
and president of Central Point Software in ad president of Central Point Software is ortland, Ore. Brown started his \$13 mil lion personal computer hardware and software business almost by accident when be was a college junior. At the time, he worked in a consputer store that sold Apple Computer, Inc. computers and the copy-protected Software Arts, Inc. Visi-calc software perkase invariable and dis-

ettes, were always ruining them, wn recalled. They would come to the store complaining that it would cost them another \$40 to get a new Visicalc disk, so

another \$40 to get a new Wincate disk, so Brown came up with a notware page for the store that would replicate the foliation of the store that would replicate the federacting page of the store that the store that federacting page of the store that the efforts, grew Central Point Software. The company now seels a couple of Apple and BM clanes that were jointly developed an expect to the store that were control of the store that the store that the store that the second software packages for micros and expects to grow to an \$18 to \$20 million company in the next fiscal year.

own, now 29, was one of 700 atte ees at the ACE convention. Many of the young entrepreneurs are high school and college students who have started busition to learn from their successful prede-cessors. The cut-off age for participation in the group is 30, although successful eneurs of any age are invited to

You have to put 100% of your heart and soul into a new business," said anoth-er Michael Brown, no relation, Brown and his high school and college buddy, Mark Callegari, at the ages of 22 and 21, re-spectively, started writing data base and spectively, started writing data base and file-management software for Vector Graphic, Inc. microcomputers. The pair worked out of their basements and had no funding when they first started Innovative Software Co. "We were living on a shoestime, but this is one industry where you can do that and be successful." Brown

you can do that and be successful, "Brown said. In the last fiscal year, Innovative Software's pretax profit was \$2.7 million. "We decided to go into comparer software because the products that were available at the time were puckaged in zip-lock baggies and had mimeographed documentation," Brown said. We realized

that while we didn't know much about this industry, we could deliver a much more professional product than what was out there. And that's what we did." The re-

From classroom to boardroom
For entrepreneurs Jeffrey Bernstein and rian Hinman, who created Pictel Corp. in Peabody, Mass., turning over the bu

s to professionals was not difficult. In fact, it was one of the first moves they made. The two started their picture teleone business right out of MIT in the

summer of 1984. Bernstein had just re-ceived a master's degree at age 22. Bernstein, now 25, said the bu

has pulled in more than \$1 million doll in sales since releasing the product last fall. When the business was only a few months old, the pair released their first olds offering, raising \$4 million in the tocess. "We didn't set out to do that oublic offering, but initially we did not get a very good reaction from venture capital-ists," Bernstein said.

Having your own business is a lot of work, Bernstein concluded. "It takes con-stant effort. I work probably 80 to 100 hours a week, and my personal life is so great. That is one of the disadu

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Conference site gets info center

DALLAS — Informert last week an-nounced plans to establish market-specif-ic educational centers at the conference

Two centers will be open by Septem-ber, and a number of current vendor ten-ants, such as IBM and AT&T, have comtted to these projects. In We are looking at technologies that we feel will command everyone's atter

tion," an Infomert spokeswomen said. "Infomert has a need for something that "Informart has a need for something that specifically focuses on these areas."

The Electronic Publishing Orientation Center will be open in May, and the Inte-grated Display of Enterprise Automation Center, which will focus on manufacturing and engineering applications, will open in September, according to Info-

Each center is slated to include dis-lays and educational materials. Actual ands-on demonstrations will be done at

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you the insights to see over the horizon and a measure of what's needed to succeed in facing the challenges of the future.



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Lessors sue IBM in Europe

BY ALAN CHEESEMAN

AMSTERDAM — Three leasing comp nies are suing IBM for alleged breaches nes are sung 18M tor aneged oreaches or regulations on pricing and maintenance. In the first action against IBM to come to court since 1984, Atlantic, IBL and Econ-ocom recently filed charges in court here. Steve Mason, managing director of At-lantic, confirmed the action. "A subsidiary of ours in Holland is involved in legal action with IBM over market practices,"

The European Computer Leasing Trade Association is watching the case closely, as it was the last orga attempt a court case against IBM. Evi-dence was filed with West Germany's monopolies commission, as late as August, 1986, but a case has not been started. Andrew Fitton, former chairman of Eclat UK, said the charges fell under Dutch competition laws

be said, adding that the suit involved two other problems in addition to the one over Chrescenson is a writer for Computer News, a CW

Communications British publication.

MERGERS & ACQUISITIONS

Nynex Corp, amounced the purchase of Business Intelligence Services Ltd. (the BIS Group). A British company, headquartered in London, the BIS Group

offers computer software, professional services and other business services. The company was acquired by Nynex in exchange for approximately 1.65 million shares of Nynex common stock.

Econocom-USA announced the acquisi-tion of Michael K. Vargo Cos. in Utica, Mich., resulting in the formation of Econ-ocom-Great Lakes. Econocom-Great Lakes marks the

rketing company to be estab

lished under the "Agency Concept" being implemented by Econocom-USA. Econo-com-Great Lakes will be responsible for the marketing of Econocom-USA prod ucts and services in Michigan, Ohio, Indi ana and part of upstate New York.

Michael Vargo, now head of Ec com-Great Lakes, started his own comp ny in the late seventies after leaving CMI Corp., where he was executive vice-president with responsibilities in marketing and development.

Cromemco, Inc. has been acquired by Dynatech Corp. in Burlington, Mass. Cromemco retains its name and con-tinues to operate out of Mountain View, Calif. Dynatech is a diversified, high-tech-nology company founded in 1959.

Scientific Micro Systems, Inc. an-nounced the acquisition of Supermac Technology, a rapidly growing supplier of enhancement products and disk drive of enhancement products and disk drive subsystems for the Apple personal com-

nuter market Scientific Micro Systems acquired all the common stock of Supermac in ex-change for 1,050,000 shares of its common stock. The business combination will

be accounted for as a pooling of interests. Supermac Technology, headquartered in Mountain View, Calif., markets its products, including the Dataframe series of small computer systems interface hard disk drives, through more than 1,000 computer retailers across the nation. The privately-held firm reported a profit of \$300,000 on revenue of \$9.5 million in

Convergent Technologies, Inc. and Oakleaf Corp. in Chatsworth, Calif., announced that the companies have reached an agreement in principle for Convergent to acquire Oakleaf as a part of its wholly owned subsidiary, Convergent Busi

ness Services.

When completed, the agreement will mark Convergent's second acquintion of a company providing turnkey solutions and services to automobile dealers. In August 1986, Display Data Corp., a leading supplier of automotive computer systems. ems, was acquired.

Hogan Systems, Inc. announced the acquisition of Systems 4, Inc. in Duran-go, Colo., for \$1.7 million.

tion software and processing services to community banks with assets of up to \$200 million. The company has annua-lized revenue of \$1.5 million and a cus-tomer base of 30 banks.

Systems 4 markets a comprehens range of software products under the

Delta Data Systems Corp., a manufac-turer of computer systems for the federal government Tempest market, and Televideo Systems, Inc. announced that they have signed a letter of intent for Teto to purchase a 51% equity interest in Delta Data for a cash price of \$4 million. Delta Data has agreed to modify certain Televideo products to meet Tempest requirements and to sell those products

into Delta Data's government markets. A nitive agreement formalizing the in-tment transaction is expected to be signed by the end of April.



Just as artists have different styles, billing requirements vary from installation to installation and from user to user. The Billing Database Facility (BDBF) is designed with the flexibility to meet these varying job accounting and chargeback

the flexibility to

be creative

requirements in MVS and MVS/XA environments. It is written in SAS®, providing the flexibility to tailor the standard reports and offering the freedom to create reports and graphs to meet special management requests.



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SAS passes \$100M mark. looks ahead

BY CHARLES BABCOCK

CARY, N.C. — The privately held SAS Institute, Inc. crossed the \$100 million mark in revenue last year, up from \$75

mark in revenue tast year, up rrom ero million the year before, a 33% jump. To Jim Goodnight, chairman and single largest stockholder, that means the soft-ware company near North Carolina's Re-search Triangle Park is selling more than the statistical analysis and confessions as it just statistical analysis applications, as it did when SAS started out in 1976. Reve-oue for that year was \$200,000, and the firm created its name as an abbreviati

for its base in statistical analysis software. Today, SAS should be viewed more as a data management company, Goodnight says; one of the key moves furthering that goal was the acquisition in December, 1986 of Lattice, Inc., the Glen Ellyn, Ill.,

SAS is in the process of rewriting its ne of analysis, reporting and data mantime of analysis, reporting and data man-agement tools in the C programming lan-guage, a project that began three years ago. In the process of looking for a C main-frame compiler, the firm concluded that Lattice differed the best — and bought the company, Geodright relates.

This evidence of growing financial muscle is likely to be put to use in a number of ways. One will be to make the firm a larger player in the microcomputer software market, in which SAS already enjoys a

"Tread in computer publications about Lotus Development Corp. and Ashton-Tate, But I never see the SAS Institute

mentioned as a micro Since its first micro software product was released in 1985, SAS has rapidly in-creased the number of offerings available

creased the number of offerings available to run on IBM PC-DOS and Microsoft Corp. MS-DOS machines, and sales in that arena now represent 15% of total revenue. In a similar vein, the firm was quick to sense an interest in running the SAS System on Digital Equipment Corp.

Jumping into mini morks?
That interest topped the list one year in
SAS's annual build of customer wishes,
and SAS's began issuing its first systems
running under DEC's VMS in 1984, a
well-timed entry into the mini software
runnet. The mini sortware
Prime Computer, Inc. and Data General
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mainframe software running under MVS and VM still account for 65% of revenue.

oodnight says. Having broadened both the scope of its Having broadened both the scope oi its applications and the number of machines on which those applications run, SAS finds redesigning the SAS System components from PL/I and assembler to C crucial so that the languages are both porta-

Exporting? CONTINUED FROM PAGE 103

eign Commercial Service posts around

the worst. In Washington, there are desk officers assigned to follow trade developments in virtually every country. For example, the following tidbits were gleaned from recent issues of the

magazine:
• The West German market for co a ne west German market for computer-raided design systems has leveled off, with annual growth rates expected to be in the neighborhood of 10% rather than the 50% kevel of years gone by.
 The port authority in Colombia invites foreign constitute. foreign consultants to bid on a contract

for improving MIS operations.

• Belgium is a good market for U.S. data

software and robots.

• Sweden is good for software. Italy is a good market for all hardware and soft-ware, and U.S. vendors have an excellent

 Laos is a rotten market for anything from U.S. firms. In Taiwan, sales will be brisk for digital private-branch exchanges, local-area net-works and all types of computers and peri-

pherals. Honduras has a small, developing man ket for computers in the government, banking, educational, commercial and in-dustrial sectors, with excellent prospects for rapid growth.

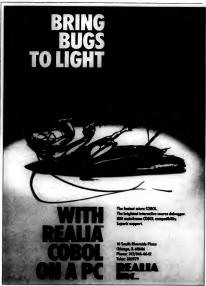
 Nearby Belize (a country the size of New Hampshire, located next to Guatemala) has a growing demand for pers

· A West German firm wants to have its data security product manufactured in the U.S. under licer

 A company in Fig. is seeking U.S. buyers of sea shells. All right, so you don't care about sea shells, but you get the point.

Here's an opportunity to get a return on your taxpayer investment in govern-ment by using government programs to help you make a profit. Now that's the

Betts in Computerworld's Washington, D.C., cor-



EXECUTIVE CORNER

James Cannavino, a 24-year veteran of IBM, was named president of the com-pany's Data Systems Division (DSD). nnavino, a 24-year veteran pany a Data Systems Division (USD).

Prior to his appointment, Cannavino
was DSD vice-president and general manager of IBM's Poughkeepsie, N.Y., manufacturing and development facility.

Baccoceds IBM Vice-President Edward

several staff and management positions

IBM's DSD is responsible for world-wide development and U.S. manufactur-ing of IBM's large systems and associated

software

H. L. "Sparky" Sparks, who devel-oped the original dealer distribution strat-egy for IBM Personal Computers, has

a supplier of IBM PC-compatible moni-tors. Sparks was also appointed a vice-president of Wyse Technology, Amdek's

Sparks'

Sparks' predecessor, Lawrence Lummin, a founder and director of Wyse, has served as Amdek's president

John M. Toups retired from his post as chairman and chief executive officer of Planning Research Corp. and was elected to the Emhart Corp. board of di-

rectors. Emhart acquired Planning Re-search in December 1986. Wayne Shelton, Planning Research

ning Research.

Arthur J. Hedge Jr. and Ned C. Lau-tenbach were elected IBM vice-presi-dents by the company's board of direc-

tors The board also elected John H. Man ningham as IBM secretary. Man-ningham will assume the responsibilities of IBM secretary from Thomas C. Irwin, who will retire July 1.

Marc Bailey was named president and chief operating officer of Samna Corp. aley was recently vice-president and meral manager of Informatics Legal

stems. Said Mohammadioun, the cor under, will continue as chairman of the rd and chief executive officer.

Andrew S. Grove, president and chief operating officer of Intel Corp., will become chief executive officer beginning next month. Grove succeeds Gordon E. Moore, a colounder of the company and chief executive officer since 1975. Moore will continue working as chairman of the

Advanced Micro Devices, Inc. an-nounced the promotion of three execu-tives. Gary Ashcraft was promoted to vice-president of the co products division, George Rigg to vicepresident of the processor products divi-sion and Fred Roeder to vice-president of the interface and logic products direc-

Thomas G. Foley has been appointed vice-president and corporate controller of Honeywell, Inc. 'a information Systems Division, Formerly, Foley was controller of the Small Computer and Office Systems Group

IBM Vice-President Michael H. Quin-Ian has been named assistant group ex-World Trade Asia/Pacific Group head-

as president and director of Cordata
Technologies, Inc.
Also, Robert J. LaBant has been
amed geselent of the North-Central
Arthur J. Hedge Jr. and Ned C. Lautembach were elected IBM vice-president.
LaBant was previously vice-president.

The Computer Dealers and Lessors Association announced that Paul R. Rupert has been named assistant executive director. Rupert will be responsible nicating the association's concerns on legislative and tax-related issues to Congress. In addition, he will direct the association's Political Action Committee Formerly, Rupert served as legislative as-sistant to Senator John C. Danforth (R-

Richard D. Stewart has been appoint-ed president, chairman and CEO of the Computer Corporation of America. Stewart was formerly president and chief operating officer of GCA Corp., a Bed-ford, Mass. hazard ment for integrated circuit production and factory automation,

Robert P. Collins has been named the first president and CEO of GE Panuc Automation North America, Inc., one of three operating subsidiaries of the new GE Panuc Automation Corp. Formerly, Collins served as vice-pres

dent and general manager of General Electric Co.'s Automation Controls Oper-ations in Charlottesville, Va., and an officer of GE. Computer Task Group, Inc. has an-nounced three promotions. William P. Adamucci, Clifford G. Baer and J.

David Ehlke were promoted to execu tive vice-presidents

Vico E. Henriques, president of the Computer and Business Equipment Manufacturers Association since 1977, has announced his resignation. enriques, who joined the association in 1970, says he will continue his duties as president until a successor is selected by the association's board of directors.

Arthur B. Branstine has been named vice-president and general manager of the systems and equipment division of TRW, Inc.'s Electronic Components Group, Branstine joined TRW a year ago from Silicon General, Inc..

Optical Fiber Technologies, Inc. in Billerica, Mass., announced the appoint-ment of Kenneth Bowes as president and CEO. Bowes replaced Thomas W. Tamulevich, who left the company to puruse other interests. Bowes joined Op-tical Fiber Technologies from Fibronics International, Inc., where be served as general manager

Hyo-Bin Im has been appointed CEO of Cordata Technologies, Inc. Hyo-Bin will succeed Cordata President Daniel Carter, who has resigned his position as CEO. Hyo-Bin previously served as executive managing director for the Daewoo Group's Planning and Coordination divi-

Artel Communications Corp. as-nounced the election of Robert L. Bow-man to the positions of chairman of the board and CEO. Bowman was formerly chairman and CEO of Telco Systems, Inc.

Davis, who will retire June 30. Cannavino joined IBM in 1963 and held

president, was also elected a vice-presi-dent of Emhart and named to head Plan-

ned president of Amdek Corp., Daniel R. Carter resigned his positions

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SAS passes FROM PAGE 109

unified system to develop.
"The conversion will give us a single system to maintain. It will certainly cut our unit cost down. We can spend more of our dollars on research and development

pit observes.

Version 5 of the SAS System nicomputer product now consists of a million lines of code, and

a special team of 20 SAS development staffers is trying to com-press that mass into a smaller, faster version of the base prod-uct, SAS officials acknowledge. uct, SAS officials acknowledge. Version 6 will be written in C and is expected to be available somein 1988 for beta-site test-

Low entry point
One of the hidden factors in the rapid growth of the company — and one that bodes well for its petitiveness in the micro-puter field — is the low en-

N THE process of looking for a C mainframe compiler, SAS concluded that Lattice, Inc. offered the best - and bought the company.

try-level cost of using the SAS

The SAS System for an IBM 3090 has a first-year license fee of \$12,000; the firm then col-lects \$6,000 for each additional year, providing a continual reve

In a similar vein, the first year license for a microcomputer SAS System is \$1,500, with a \$1,000 fee collected each suc-

ceeding year.

With its users more broadly scattered through their corporations, SAS has initiated what ints to a site-license fee of \$7,500 for up to 500 worksta-tion users, with an annual renew-al fee of \$5,000.

For a site with 500 users, that mounts to \$15 per user the first year and \$10 per user for each ng year, Goodnight

points out.

Some might argue that th es add up, while the purchase other suppliers' microcomputer products are one-time fees, er products are one-time tees, even if they amount to several handred dollars. Goodnight ex-plains, however, that updates of the micro spreadsheets or data bases require another one-time fee and come out with a regulari-ty that outstrips SAS's annual renewal rates.

One thing is clear, however.
At the recent SAS Institute users group conference in Dallas,
customers had complaints about customers had complaints about the SAS System, but they never

One complaint came from James Young, a biostatistician and SAS PC user at Syntex, Inc. in Palo Alto, Calif. Young said

in Palo Atto, Calif. Young and SAS needs to provide support for expanded memory board use with its PC products. Otherwise, Young continued, too much of the PC memory is devoted to the SAS System and too little to the data with which

Another user, Wendell Re fior, a research analyst with elec-tric utility Boston Edison Co., said one way in which SAS lags behind other software compa nics is that it has never taken the time to publish a manual saying what the SAS System error messages mean, leaving the unin tisted frequently scratchin

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Federal jobs offer fast growth

But low bay, internal hiring policies present steep obstacles

BY EVE OPPENHEIM



the largest data processing bud-gets, totaling about \$17 billion annually, federal agencies pay ntially less than private instry for personnel, particula ly for entry-level and sensor MIS

employees work with the most advanced technology - from the Department of Defense's Strategic Defense Initiative pro-gram to the Federal Bureau of vestigation's expert systems development projects. Also, because of personnel shortages within federal agencies, government employees can rapidly through the MIS ranks.

Skills currently in demand within the government include expertise in computer-performance evaluation, statistics, data base management, quality assurance and artificial intelligence. Agencies also seek general business management skills. such as accounting and finance, when filling MIS positions. Above all, prospective employ-ees should be able to understand government structures and work well with senior people, say mid-level DP managers.

There are drawbacks and risks in pursuing government positions. For example, the wait-ing time for employees for a posi-tion with a defense agency requiring security clearance can be up to nine months, without pay.

Patterns of government contract awards and hiring are changing. In the past, DP jobs were filled almost entirely by existing government employees through interagency transfers, internal promotions, reassign ments and even reinstatements of former government workers. The proportion of MIS positions still filled internally is estimated at 80%. Once employed, howev-

er, government workers can take advantage of numerous job

training programs and many op-

For example, Ken Lively, di rector of communications security and material systems for the Navy, began his career eight years ago in a clerical position. He took DP courses at night and, after approaching a Navy ADP director, was hired as a computer trainee. Previously, Lively had worked for two years at a vings and loan association.

Despite internal hiring poli-

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ncies skirt salary limitations by hiring managers at grades of GS 11 to GS 15, which increases the salary range to be-tween \$27,200 and \$64,500.

federal agencies is on an inter-agency basis. The OPM fills only 20% to 25% of the vacancies cies, shortages of qualified per-sonnel have forced the govern-ment to look outside its ranks for Competition from the private sector for these positions has resulted in what some government MIS manag-To increase salaries beyond the specified limitations for cer-

Getting into government Data processing and other professional cro-by the government

tain levels, the government hires MIS people at inflated job grades. Mid-level MIS managers grades. Mid-level MIS managers are ranked at grades of GS 9 to GS 12, with salaries ranging from \$22,400 to \$42,300. Ac-cording to the Office of Person-nel Management (OPM), many Much of the hiring done by computer installations is two to three times the size of private-sector facilities, says Reed Phil-lips, director of information resources management for the Department of Commerce.

from its Register of Candidates. which lists candidates outside specific agencies. The heaviest users of the OPM register are the Army, Navy and Air Force, followed by the Veterans Adminration and the Department of

mechanisms exist to "reward

ment as independent contrac-tors. Government spending on third-party computer-service providers has grown at a much higher rate than the hiring of government MIS staffs during government MID scales was the last 10 years. Growth in the use of outside contractors is ex pected to remain strong relative

Ross of the General Services Ad-

shop might outweigh this disa

Experienced MIS profession als can also work for the govern

nistration (GSA). But the onportunity to work in a larger

The impetus for this growth has been Executive Order A76, which requires federal agencies to evaluate whether government projects can be more efficiently performed by outside contracters. Independent consultants sions for overhead and profit into invoices, government compe sation is equal to that of the provate sector

According to Ross, the GSA awarded \$50 million in program-For managers, the greatest tracts in 1979. In 1987, this figure is expected to reach \$170 difficulty in government work may he dealing with the employmillion, representing an average ees. Government employees are hard to manage because no annual growth of 16.5%.

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Henry F. Nanio Director Systems and Data Processing City and County of San Francisco Age: 58

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As the City and County of San Francisco has discovered, there's only one sensible way there's only one sensible we to evaluate and integrate products into one cohesive information system. And that's with a department strongly guided by an experienced, importance information services professional like

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dollar budget, with responsibility for the acquis
tion of hundreds of micros every year. In fact,
when he started working with San Francisco's

computers 31 years ago, Henry didn't even have a DP department. He simply worked in account-

ing with his state-of-the-art IBM 305.

Over the years, many of the applications. Henry developed have helped keep San Francisco among the country's most innovative users of computer technology and prediction among the country's most innovative users of computer technology and prediction of the properties of the prop

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Shasta Mountains. If you'd really like to reach Henry, you'll

find him on Monday mornings with his copy of Computerworld—he's been a subscriber since the first issue. He finds Computerworld's per-spective meshes closely with the way he does

spective meshes closely with the way does business, covering everything from meinframes to micros, software and state-of-the-art technologies. Information Services is full of bright indi-vious with individual visions. Yet they all seem to have one common insight. Their favorite pewspaper.



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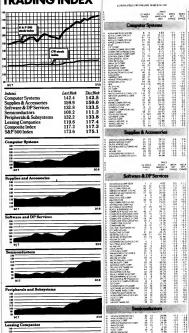
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Stock trading summary



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Microsoft on high

DUDGE WEEK

Diversification, forthcoming DOS release sway investors

of its applications packages, analysts said. Microsoft Corp. was a searing issue last

Sales of Microsoft stock were up because Sales of Microsoft stock were up because the company has become less dependent on its operating systems to generate revenue and, nasced, is concentrating efforts on applications packages, according to analysis. The company's floured analysis of the company's floured analong restainmishe with BIM and anticipation of DOS coming out in the full, the smallyst said.

After slight bosses earliers in the week, Microsoft jumped 44% points to close Webscridy at 85%. By Thursday's Color, the stock had gone up another 1 N to 19 N;

Continuing to ride the Dow Jones seesaw were manufacturers IBM, Compaq Comput-er Corp., Hewlett-Packard Co. and Cray Research, Inc. IBM, which continues to be on the most

active issues list, was up and down all week and closed Thursday at 147. Compaq's stock closed Thursday at 29%. HP surpassed its 365-day high at the week's end, closing at 60% on Thursday.

ALANJ. RYAN MARCH 23, 1987

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SAA scope compared to SNA

BY DONNA RAIMONDI

RYE BROOK, N.Y. - The Sys tems Application Architecture (SAA) strategy announced for-mally last week by IBM initiated a common interface project that the firm said will grow and e into the next decade.

"Our products today alread nclude many of the elements in SAA," said John Friedline, manager of software marketing at IBM's Information Systems Group. Products written to SAA

1990s, be added SAA may be the most signifi-cant announcement from IBM since Systems Network Architecture (SNA) was unleashed in 1974, according to Paine Webber, Inc. analyst Stephen Smith The strategy says that all soft ware written to SAA standards Computers, System/36s and 38s dors' architectures

SAA will evolve much the me way that SNA did. Friede said. The company started I into the 1990s, he added. This is Step One in a long journey, but it won't take until the '90s to have products for it." IBM would not say when the first

applications will appear, but they re in development.

For Travelers Insurance Co.,
subsidiary of The Travelers Corp., having simple screens to access mainframe resources is one of the highest priorities, ac-cording to Richard Boyle, assiscording to Ri tant director of Travelers' Com-puter Sciences Division. The company is addressing that probby writing programs to pro-

a single-image system.

"SAA could be a real help with

that where it seems like a single

frame environment,

mputers."
By isolating applications from underlying communications from tocols. SAA would spare MIS managers like Boyle the task of "teaching programmer" com-munications when I want them to spend their time learning the business they're dealing with so they can write better busin applications," be commented.

software development houses and analysts contacted by Computerworld, while mai taining that SAA is a critical strategy, said they were union pressed by the contents of IBM's nt. The release included lists of protocols, conver tions and interfaces that would be included in SAA development "We are already writing to some of the standards IBM mentions

anning at mainframe software house Applied Data Research, Inc (ADR)

At the PC level, SAA will not have much impact for at least a couple of years, according to Robert Carr, chief scientist at Ashton-Tate. "The kinds of user interfaces and functionality that the first SAA applications will tend to have will be reminiscent of what you might find on a System/36 and 38 today for office automation, and that tends to be what Ashton-Tate or Microsof or Lotus is selling into," he add

Carr would not say whether Ashton-Tate plans to write to SAA specifications. "SAA will affect PC software com general to the degree that they want their applications to mi-grate up from PCs to the minis or mainframes and to the degree that SAA ultimately embraces the best things about PCs, such as including rich graphical user

ons aspects of SAA will proba-

SAA environment. The focus ats

tially will be on office applica

and library, personal service and mail and decrease autoport.

Expensive alternatives Adding a high-level software lay-er for applications to go through

on their way to the data could

slow down response time on low-er end PCs, Drubeck indicated. But this is infinitely prefera-

ble, as far as SNA software de-

velocers are concerned to the

expensive alternative of rewrit

ing or replacing existing and widely installed communications

cations programs, such as Ad-Program-to-Program

the future SAA versions of the

products without reprogram ming, Drubeck predicted, How

ever, as time goes on, many com-panies will choose to reprogram

their software applications to take advantage of SAA's expa

ed capabilities, Daubeck com

mented.
"This announcement made us

very comfortable with what

protocols he added Applications based on the ex-isting versions of IBM communibly be the most successful part of the program, because that is where the buggest need for standards lies, according to Carr. But the comm

eas IBM addresses in SAA held some surprises for ADR's Percy. "IBM has been promoting the Server Requester Program Interface very strongly lately, but I don't see it listed in the an nouncement. They also say To ken-Ring is important, but they don't mention Netbios, which is supposed to be a consistent inrface across PC networks and

In order for items to make last week's announcement, product managers at IBM had to mise management they could produce all of the items in the lists of protocols and prod within two years, according to Francis R. Gens, a vice-president at International Data Corp. Framingham, Mass.-based et research firm. That is why there are so many interest ing ommusions on the list, he

Distributed

programming involving different application programming inter-faces, most of which require As-sembly language coding. We want to add high-level architecbeck remarked

IBM proposes to solve its longstanding communications incompatibility problems by covering them with a blanket of high-level The solution addresses some

important user and programmer needs but will take several years to implement, industry experts predicted and IBM admitted. The announcement address-es IBM's vulnerable spot in the firm's war with Digital Equip-ment Corp. "Right now, every-thing IBM does is intertwined can't port it, except through Assembly language reprogram-ning," observed Frank Dau-beck, president of Washington, D.C., consulting firm Communi

harping on as a strategic thrust against IBM. So now IBM is reiterating, 'We don't believe the same muchine architecture ud exist on all product lines, ut now we're offering insulation between the application deve oper and the machine itself,"

The PC environment In the ideal SAA world envi-sioned by Richard Boyle, assistant director of the compu sciences division at Travelers In-surance Co., "When an applica-tion on an IBM Personal Com-puter pulls down data from a aframe, it only deals with the PC environment - and it reis unaware whether the communications supporting that data access is Synchronous Data Link Control or Token-Ring net-

ork or whether the data come om a PC environment or CICS. IBM's overall strategy is to insulate applications from communications protocols," Dzu-beck said, providing applications programmers with a consistent set of high-level programming building blocks that, once incor-porated into an application, will Architecture (SNA) Distrib provide transparent access to various IBM and industry-standard communications protocols that have been blessed by the wendor as part of the SAA framedard com

SAA, as defined in last Tues day's release, is composed of four elements

Common User Access de hnw the user interacts with SAA networking and applications. Common Programming Interface includes several standard languages, including Cobol and C; a data base interface based on the IBM's or ANSI's Structured Query Language; a query inter-face based on IBM's Query Manment Facility; and a presen tation interface that is said to be based on extensions found in IBM's Graphical Data Display

Common Communications Support includes IBM communicurrent Interchange Archi tecture and Systems Network

or communications architect Services, as well as the CCITT X.25 packet-switching protocol and the IBM Token-Ring net-Inc. based in San Jose, Calif., an other SNA-based software ven work, which is based on both the IEEE 802.2 and 802.5 standor. "I feared that IBM would announce another, different in "When we can use national or international standards [in SAA], we will," Friedline emphasized. Fourthly, IBM intends to de-

Conflicting messages By defixing IBM's future con munications architecture SAA

velop, during a period of years, Common Applications across the could be a boon to software developers who have been confused about IBM's future sup port of recent and apparently tions and, secondarily, on indus-try-specific applications. The elements that are being defined conflicting software announce ents such as Service Request Program Interface (SRPI). now include document creation Pickens indicated, IBM has not make SRPI part of SAA, Fried

line stated Another matter of cor for software developers is the fu-ture impact of IBM's Common User Access Interface, whose initial publication is slated for the third quarter of 1987

The interface, which will act as Easton between PC and terminal users and the applications within SAA, is likely to have an immediate impact on the cur-rently installed IBM office system products such as Distribut-ed Office Support System, Professional Office System and Personal Services. Pickens ore-

A commonly held organion is that SAA will be a key compo nest of the future Intel Corp 80386-based machine - and vice versa. According to Daubeck, the 286-based IBM PC AT is the lowest horsepower IBM workstation that can comfort ably support the SAA user interface he envisions, which will be multitasking, with the ability to

consideration and the property of the first property of the consideration and the consideration of the considerati

STMASTER: Send Form 3579 (Change of





Lotus fired up, still stalks 'copycats'

BY PEGGY WATT

CAMBRIDGE Mass - Lotus Development Corp. is not back-ing down in its legal battle against alleged copyright in-fringements, despite industry criticism and legal jockeying that has included amending the firm's request for damages.

dropped its initial claim for \$50 in putitive dam against Paperback Software International in Berkeley, Calif., publisher of an alleged Lotus 1-2-3 clone, Lotus still seeks trebled damages plus attorneys fees under a Massachusetts stat tus attorney Henry Gutman as-

serted

Lotus also claims makes to ofits from the sales of Paperback Software's spreadsheet, VP-Planner, and The Twin from Mosaic Software, Inc. located here. Mosaic is the defendant in a separate suit. Paperback Software chal-

tus explained. The delay has cost Lotus at least one contract. Last week,

the Commercial Banking Group of Wells Fargo Bank NA in San

Francisco decided to go with Computer Associates Interna-

tional, Inc.'s Supercalc4 instead

of The Networker, said Kingsley

Mar, the group's manager of re

pieces and the development ta

ble [for The Networker] were too far behind schedule. They

were upset we signed with Com

nater Associates International

Inc., but they were too far off

course to be considered." Man

Access counter frustrating

the most frustration with the ac-

cess-counter method employed

by The Networker in place of

That method requires that

the software be preconfigured to support a specific number of net-

work nodes. The system must be

completely reconfigured - a

cumbersome procedure - to

support additional stations, sev-

users asserted. There was a huge outcry

Beta-test users have expres

search and development We had a big local-area net work project ready to roll out, but it looked like the timing of

Networker

FROM PAGE 1

lenged Lotus's right to additional damages in its first reply to the charges. The defendant also claimed Lotus was sung the wrong company, noting that Ste-phemon Software Ltd. in Vancouver. B.C., developed VP-Planner and contracted with Paperback Software to market

Lotus's reply was to add Stehenson Software to the suit Gutman noted that Lotus had red - and rejected including the developer in the original sust, saying, "But if the dant wants us to we will Defense attorneys said they will now raise questions of juris diction, but Lotus attorneys said

the case will remain in the Mas sachusetts court where it was Also, while defendants applauded when Lotus was denied a separate audio-visual copyright for the 1-2-3 interface, Lotus still retains a general convright of the product

Lotus spokesmen said the company will begin to reply to and runs counter to what other

networking software cor networking software companies are offering users," said Michael Goulde, a small-systems analyst with The Yankee Group, a re-search firm in Boston. Some of those vendors provide unlimited-use licenses. Users have also expressed

spleasure with the screen and drivers for The etworker, as well as the amount of overhead required. Lotus director of corp communications Greg Jarboe

THE WHOLE approach is silly and runs counter to what other networking software companies are offering users

> MICHAELGOULDE THE YENKEE GROUP

confirmed some of the problems ited by users. "Users have said 'If you want to ship a product that will be successful in the market, then you better fix these problems, "he said. Despite those difficulties

The Networker reportedly will contain features outlined in a release in August, such as The Network File Access Program. Implemented as 1-2-3 or Sym phony add-ins, the program is said to allow networked users to retrieve work-sheet files in a manner that denies other users access while the file is in use

This eliminates the risk of users

over this back in October." John McCarthy, an analyst with Forrester Research, Inc. in Cambridge, Mass. "It's very inflexible, especially for large net-The whole approach is silly widespread criticism that de-picts it as a Golisth seeking to soussh small, unovative devel-

We think we're on the side of David," said Greg Jarboe, director of corporate communica-tions. "Little communies have the most to lose if Lotus loses the case." If software loses copyright protection, small firms' in novations will be copied by large

companies, Jarboe explained "We're not trying to copyright the spreadsheet concept. We're suing the two who are keystroke-for-keystroke es," Jarboe added.

Paperback Software pre-dent Adam Osborne content VP-Planner goes beyond 1-2-3's capabilities and is an enhanced etitor rather than a clone. Paperback Software attorney James Garrett said the firm will

reply by the end of March to Lo tus's amended complaint.

In the Mosaic case, the next action is Lotus's pending reply to Mosaic's request that charges be

overwriting data in shared work sheets I otus explained "It's kind of a guessing gam

over at Lotus over how many us-ers to license," The Yankee Group's Goulde said. Lotus has historically insisted on a oneuser, one-copy policy, and some sources noted that Lotus's networking follows that policy. For example, users will still

ave to buy one copy of Lotus per user, although they will not physically be using them. After installing The Networker Pack on the file server, users must then take the existing Lotus apdications and de-install them off the regular PCs.

Each serial number, however of each Lotus come is stored at the file server, which recognizes authorized users. Users would reinstall copies from the file erver, pointed out Raymond Di-Casparro, a partner with Brown and Associates, a network resell-er in Belmont. Mass.

You wouldn't have copies of Lotus on software, you'd have five 'counts,' " added a beta-test

It's not truly networking. said Wells Fargo's Mar. "They have just put patches in to pro-tect the number of copies out there. To me, unless these applications are totally uncopy-protected, then they are too cum bersome to work with Another user, in the informa

tion services industry, adopted a different stance. "The interesting thing is that they are saying, Look, we're gonna give you credit for what you've bought." Computerworld staff writer Alan Ryan contributed to this The MIS machine. According to a respected industry ex-ecutive, IBM next week will announce an Intel Corp. 80386-based microcomputer that includes some operating system code in its hardware. The machine, aimed directly at MIS and DP, allows applications development for IBM's world bless may be 80386 from bine.

LINES

NSIDE

Shifting strategy. National Advanced Systems appears to have changed its mind about value-added systems notive wars. Several years ago, it virtually had to down internal systems on the company in the company in the company in the company in the compact of the nations near uses that is has created a system so divare development center in Atlanta. NAS staffed the center by himsing former Sperry Cope, engalyses who were displaced when the Unity's mergur closed the Atlanta operation in December and are now and to be developed.

Expanding position. Lotto-restores are anticipating that the first a April 27 assessment will fished as in the the first a April 27 assessment will fished as in the control of the contro

The big main to speak, Digital Equipment Corp.'s Ken Olsen is sketch to preside this Tuesday at the announcement of a "major" computer-integrated stransferring announcement. Analysts specialise that DEC will introduce an enhanced version of its Baseway factory-communications and data management software as well as a ruggediace version of the Macroway that would read on the factory floor.

Unification plans. Unisys Corp. is expected to introduce several products in New York this Wednesday, including Burroughs mainframes and a Sperry workstation based on the Intel Corp. 80386 chip. In addition, Unisys is expected to announce products connecting the Burroughs and Sperry

Still hungry. Computer Associates International. Inc. is apparedly on the provi for more acquisitions. The Garden (Try, N.T., systems house is used to looking at firms) from the control of the control

A done deal. Curt Monash, the brash young software in-dustry analyst at Paine Webber, in reported to be cleaning out his deal after a failing out with Paine Webber manage-ment because of some recent bad calls. The research task now fails to Robert M. Therrien, Monash's co-analyst in the New York office.

Say is ain't and Originally scheduled for March 30, the of-ical debut of ETA Systems, inc.'s ETA-10 supercomputer has been paraposed for all sens if lev weeks. The immerica-tion of the sense of the sense of the sense of the Talidanase, Pas, but has been elsipted by scheduling con-flicts, scoording to officials at the company and the school, which has been a beta-test site for the system for three months. Meanwhile, moreor continue regarding a possible restructuring of ETA Systems, with resports contenting on ETA Assign elseshed by former purest company. Control STA Assign elseshed by former purest company.

Secting in believing, Apple Computer, Inc. can offer a multivasking Macinton by using its system tool Funder "my time we warf, according to Jern-Louis Gaussee, Ap-ple's vice-president of research and development. But the feature won't be testinged soon, because he wants is perfect. Gaussee midded, Another Apple Official. Vice-President of Ad-vanced Technique Jury Teller, citation the issue when he said Funder's immediate multitasking is limited to appli-cation resuppage with the Switcher utility built how Fader.



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